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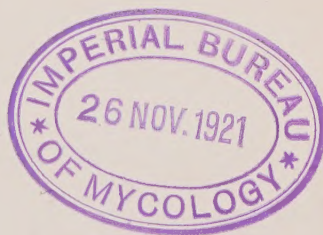
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PRICE,
SIXPENCE.

FISHY FLAVOUR IN BUTTER.

A PRELIMINARY NOTE ON AN INQUIRY INTO THE CAUSE OF THE DEFECT.

C. J. REAKES, D.V.Sc., M.R.C.V.S.; D. CUDDIE, Director of Dairy-produce; and
H. A. REID, F.R.C.V.S., D.V.H.

A CONDITION which from time to time has given rise to much anxiety on the part of both producers in this country and butter-merchants in Great Britain is the development of the so-called "fishy" flavour arising in certain shipments of butter exported from New Zealand. It therefore became necessary to endeavour to discover the source of the development of this peculiar and offensive flavour, and the factors underlying its production. An investigation for this purpose was accordingly commenced.

The flavour complained of must be sharply distinguished from rancidity, or flavour resulting from age or obvious contamination. With the odour present it suggests the taste and smell of some varieties of

fish-oil. It has also been compared to that of stale tinned fish. A notable likeness is found in the odour evident on table utensils which have been used with fish and set aside without having been properly cleansed.

Former work on this subject had been undertaken, chiefly by O'Callaghan in New South Wales, and in America by Rodgers, Rahn, Brown, and Smith. The conclusions then formed, particularly by Rodgers in 1909, are to the effect that bacterial growth plays little or no part in the production of the objectionable flavour, but that in all probability the change is induced by a chemical process resulting in the oxidation of an acid combination developed during the ripening of the cream, the principal factors necessary for its production being a high degree of acidity in the cream, and the introduction of an excess of oxygen by the process of overworking during churning operations.

The view formerly held by O'Callaghan, that the development of the fishy flavour was invariably due to the presence of the mould *Oidium lactis* must be held to be untenable. Butter in which no trace of fishiness is apparent sometimes contains this mould, and experiments to artificially produce the fishy flavour by the inoculation of clean butter with pure cultures of *Oidium lactis* have repeatedly failed. No support can be given to statements attributing the change to the effect of certain grasses or plants ingested by cows yielding the cream-supply, nor can the appearance of the flavour be traced to contamination by water used in the process of manufacture. Further, the contention that dirty surroundings in which cattle may be kept are directly responsible cannot be upheld, though we are loth to excuse any such factor which in itself is highly undesirable in the successful production of an edible commodity. On the other hand, unsanitary conditions in the creameries and factories may constitute an exceedingly favourable means for the production of fishiness.

The natural outcome of the fact that other flavours in dairy-produce perhaps originate solely, or at any rate are for the most part dependent upon the presence of certain bacteria, suggests that in all probability fishiness may also be attributed to their agency. In order to therefore ascertain what part, if any, bacteria shared in promoting this abnormal flavour, a study of the comparative bacterial contents of normal and fishy butters was undertaken by one of us (H. A. R.). The flavour occurring, as it seemed probable, under conditions of low temperature made it necessary to discover what organisms are capable of development under such conditions. The fact, also, that hyperacidity of the cream was known to render butter more prone to become fishy led to the comparison of the bacterial content of butter made from cream of high acid with that of normal acid content. For the latter purpose twelve samples of butter were supplied by Mr. W. E. Gwillim,

Dairy-produce Grader, from the butter experimentally made at the Konini Factory, as described later herein. These had been kept in cold storage for a period of two months. Six of these samples showed a comparatively high acid-content averaging 0.40 per cent. of the cream, and had become distinctly fishy in two months after churning. The others, which were of clean odour and flavour and averaged 0.31 per cent. acid in cream, were submitted for comparison. The result of the bacteriological examination of the samples by cultivation upon neutral agar and gelatine media showed very little difference in the variety of organisms present in each. Tubes of the above media were inoculated, high normal acid butters in separate batches lettered A to F being used. Incubation at 37° C., in the case of the agar, and room-temperature for the gelatine-tubes, only produced in either case a tardy growth of bacteria, for the most part belonging to the lactic-acid group. Butter is not, in fact, a favourable medium for bacterial life, the number of organisms tending, in good butter kept under proper conditions, to diminish in proportion to its age. *Oidium lactis* and *Bacillus fluorescens liquefaciens* were seen to develop in five out of the twelve samples of butter examined, and the degree of acidity of the butter did not appear to influence the growth of these organisms to any appreciable extent.

Isolation upon plate cultures of these organisms, and also the micrococcus (*Lactis aureus*), and inoculation of fresh sterilized butter did not lead to the production of fishy flavour. In many instances the isolated organisms failed to multiply when transferred to another butter media. In order to ascertain whether any special bacterium, or group of bacteria, developing only at low temperatures, might be responsible for the production of fishiness, gelatine plates were inoculated with fishy butter, kept at room-temperature for three days, and then placed in a cool chamber at a temperature of 12° Fahr., where they remained for ninety-two days. The plates were examined at intervals throughout this period, but no bacterial growth could be discerned. They were then returned to room-temperature, when, after the third day, colonies were seen starting to develop. Commencing on the thirteenth day, a systematic examination of these was conducted. The colonies were found then to consist of a torula (unidentified) with, in addition in one case, *Oidium lactis*. The same procedure applied to the group of higher and lower acid butters maintained at 12° Fahr. for eighty-three days, and at ordinary temperature for thirteen days, yielded similar results.

Further experiments were now undertaken with the object of ascertaining whether any organisms responsible for the flavour would appear in an acid media which they might require for their development. Media was accordingly prepared consisting of acid lactose gelatine (2 per cent.), the media having been rendered acid by the addition of lactic acid in the proportion of 1 per cent. and 0.5 per cent. For con-

venience of reference the former media was designated acid+, the latter acid-. Plate cultures were prepared, each inoculated with emulsions of fishy and normal butters. Following the scheme of the previous experiment the plates were held at a temperature of 12° Fahr. for seventy days, during which period no bacterial development was observed to occur. They were then removed from the refrigerator, and kept at room-temperature. At the end of a week a growth commenced to take place. On the thirteenth day the contents of the plates were examined, with the following results:—

F1 (fishy) acid +	..	<i>B. fluor. liquefaciens</i> , <i>Oidium lactis</i> .
„ —	..	Non-liquefying <i>Torula</i> .
F2 (normal) acid +	..	<i>B. lactis acidii</i> . <i>Torula</i> growing slightly below surface, liquefying and non-liquefying.
„ —	..	Liquefying <i>Torula</i> , <i>B. lactis citreus</i> .

None of the above proved accountable for the development of fishiness. Finally, in order to subject the question to a practical test, the following experiments were carried out:—

(1.) A plug of butter was removed by means of a trier from a box of sound unsalted butter, the cavity left being immediately filled with a plug of butter possessing pronounced fishy flavour. The box was afterwards closed and placed in the refrigerator at 12° Fahr. After being allowed to thaw, this butter was examined seventy-four days later, when it was shown that no extension of the flavour from the fishy into the sound butter had taken place. The box was again closed and returned to the freezing-chamber. It was re-examined seventy-five days later with the same result, although the plug of fishy butter retained the same degree of fishiness as when introduced 149 days earlier.

(2.) Consisted of the converse of the preceding experiment—namely, a box of fishy butter was inoculated with a plug of sound butter. Examinations were made at intervals as previously stated. It was found that the plug of sound butter remained perfectly sweet, while the fishy butter had developed, to an even greater extent, its objectionable flavour.

(3.) Experiments with salted butter on similar lines were also undertaken, plugs of fishy butter being inserted into the centres of boxes of newly manufactured clean-flavoured butter after the removal of a portion of the latter with a trier, plugs of normal salted butter being introduced into centres of fishy butter. The inoculated boxes of butters were kept at a temperature of 12° Fahr. After forty-seven days examination of their contents failed to disclose any extension of flavour

into the butter surrounding the plug. Further experiments with unsalted fresh butter inoculated with fishy butter, extending over the same periods as the above, were followed by the same negative results.

So far as they have been pursued, our experiments have failed to show that the development of so-called "fishy" flavour in butter is directly dependent upon bacterial agencies, although it is conceivable that bacteria exerting a hydrolytic action upon the protein constituents may result in their decomposition with subsequent liberation of products giving rise to this flavour. We have, however, been unable to reproduce this condition experimentally with such organisms as have been isolated from fishy butters by ordinary laboratory methods. One of us (D. C.) has succeeded in reproducing intentionally the fishy flavour in butter made from pasteurized cream by the use of overripe cream which had been allowed to develop too high a degree of acidity.

By the kind permission of the directors, these experiments were conducted at the Ballance Dairy Company's Konini Factory under the direction of the Dairy-produce Division, and the results were even more conclusive than had been expected.

Each day for six days a special vat of (pasteurized) cream was selected and ripened with a sound-flavoured lactic-acid culture to a degree of acidity that was calculated to produce a good-keeping butter. The acidity of the cream having been ascertained, a portion of it was then churned and treated in the usual manner for export butter. The remainder of the cream was held for a longer time to allow of the development of a greater percentage of acidity. When the higher percentage had been ascertained, this cream was also churned. One box of butter from each of the churnings was then specially marked and forwarded to the cool stores at Wellington. We thus had a "control" from each day's work, one box of butter made from what was considered to be properly ripened cream, and along with this another box of butter churned from the same cream overripened.

This experiment was repeated daily until twelve boxes of butter were made from differently ripened lots of cream, the cream for each day's pair of boxes being thoroughly mixed and then divided for the purpose of varying the ripening process.

On the 14th March the whole of the butter was examined for quality, flavour, and acidity, and was then placed in the freezing-chamber for two months. At the end of that time it was withdrawn and defrosted for further examination, which took place on the 19th May. It was then found that every one of the "control" boxes of butter made from cream properly ripened was of good quality, while that made from the same cream excessively ripened was inferior and possessed a "fishy" flavour.

The results were most conclusive, in that the greater the degree of acidity in the cream and butter the more pronounced was the taint of fishiness, clearly proving that the overripening of cream is highly dangerous to the quality of the resultant butter. It is not claimed, however, that high acidity in cream is the direct cause of this serious defect called "fishiness" in butter, but our experiments proved that overacidity is evidently a very important contributing factor.

The average acidity of the cream which made the good-keeping butter was 0.318 per cent., while the average acidity of the cream which made the fishy butter was 0.40 per cent.

It would appear from our tests that the butter contains about one-half the acid developed in the cream.

Further practical experiments on a large scale in this direction are to be undertaken with a view to obtaining an average of results by this means. We are for the present therefore led to concur with Rodgers in the opinion that the development of fishy flavour in butter arises as a result of a chemical change inducing a splitting-up of some of the constituents into compounds possessing this peculiar character of smell and taste, the factors responsible for such change being apparently a degree of high acidity of the cream and overworking.

WINTER FEED FOR DAIRY COWS.

TOWARDS the end of last winter and in the early spring a very considerable mortality occurred among dairy cows in certain districts, the cause of death being nothing more or less than sheer starvation. Further, many other cows came to their calving so reduced in condition through lack of sufficient feed that they must prove unprofitable to their owners, the feed they got, when it did come along, being principally utilized by nature to build up their debilitated systems, instead of its proper proportion being available for milk-production. This unfortunate state of things was, of course, the result of the unusually dry nature of the summer and the early autumn of last season; and though it is unlikely that the same climatic conditions will again prevail this year, yet the object-lesson furnished should make dairy-farmers realize the absolute necessity for providing a sufficiency of proper winter feed for their stock. In bush districts it is not easy—in some cases practically impossible—to save hay or grow roots, but the provision of ensilage, at any rate, should be quite feasible. This question will be more fully dealt with in another issue of the *Journal*, but, meanwhile all dairy-farmers who have not already decided to make proper provision for winter feed should realize the necessity for doing so, and take proper steps accordingly, not only for the sake of their pockets but in the interests of common humanity.

ENSILAGE.

DEMONSTRATION AT MARTON JUNCTION.

To the farmers of New Zealand there is no subject more deserving of consideration than the conservation of fodder by means of ensilage. Not only the dairy-farmer but the stock-raiser in general has in silage a means of converting uncertainty into certainty. It is a valuable insurance against the vagaries of nature, the visitation of parasitic pests of plant-life, and the accidents inseparably associated with farming operations.

Under no other system of feeding can so much forage that is so palatable and of such feeding-value be so safely harvested, stored so economically, and fed with so little waste. In the future it will be regarded as an almost indispensable adjunct on the well-conducted dairy farm, not only as a safeguard against drought and even very wet seasons, but as a sure means of maintaining a constant supply of succulent fodder.

For milk-production there is nothing to equal the grasses and supplementary green crops in their succulent stage. Should these ideal feeding materials not be available it is reasonable to suppose that the best substitute is a supply of them in such a preserved condition that their desirable feeding characters are largely retained—that is, when the starch, sugar, and gum are to a great extent saved in a soluble and digestible condition. This is what ensilaging of green material does. The principles of silaging are extremely simple. By the exclusion of air the fermentative processes are controlled, or are permitted to proceed at such a rate that they cook the material to the required degree, the admission of more air leading to a putrefactive fermentation. Just as science has of late years brought to our knowledge the fact that bacteria play a most important part in successful management of the soil, so in silaging we have in bacterial control the fundamental principle.

Not only by reason of its good feeding-value but owing to the beneficial influence it exerts on the health of stock, silage is commanding increasing attention in many countries where milk-production is being prosecuted on up-to-date principles.

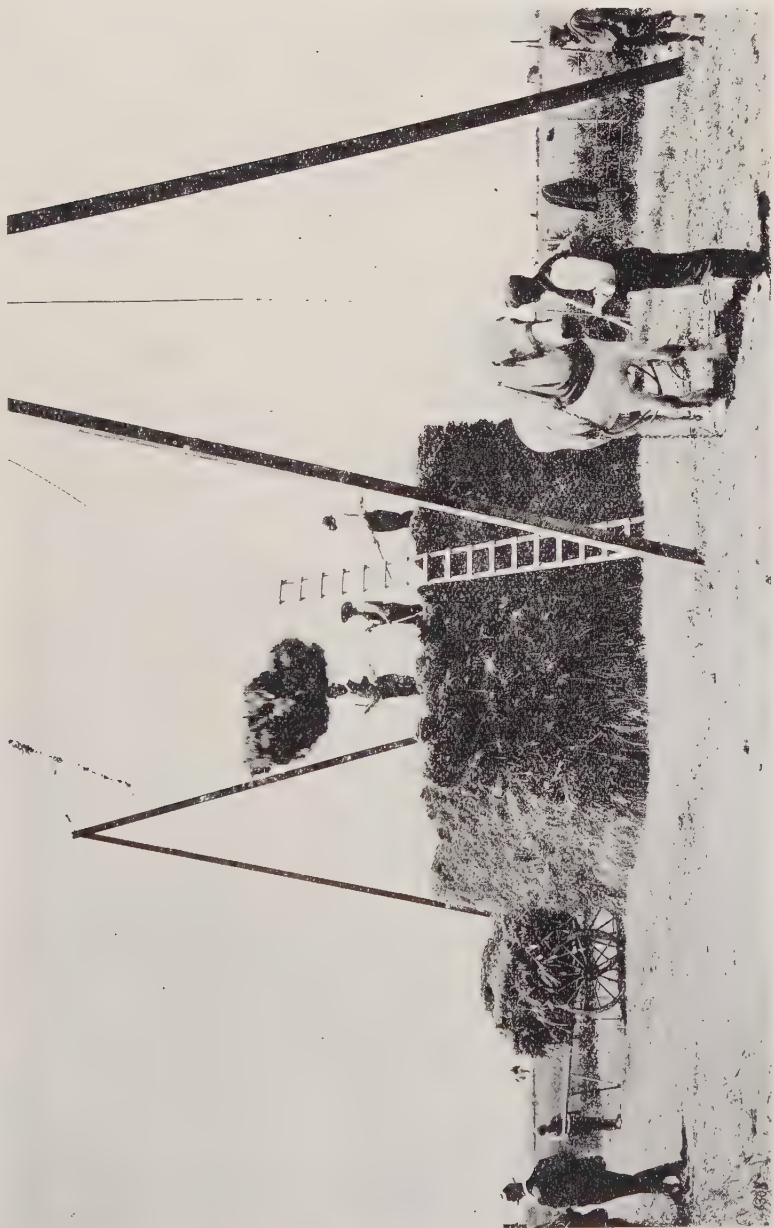
It may be well to point out that silage should be fed in a judicious manner. It should never be oversupplied, and to obtain the best

results it should be given with hay. In summer-time this does not apply to the same extent as it does in winter, as in the drier months the cattle have in the matured herbage of the pastures a sufficient corrective. Again, in feeding silage it is well to only supply it to milking-stock after the milk has been drawn, as any possibility of tainting the milk is thereby removed, while silage being about during milking or near where the milk is stored will probably taint the milk more than the mere feeding of it to the cows.

A demonstration in making stack silage by modern methods was conducted last month by officers of the Department with material specially suited for the purpose at the co-operative experimental plots at Marton Junction. Of the crops tested was one specially suitable for silage—oats and tares. Several varieties of the former were tried—Triumph, Victory, and Propsteier—all of these being noted for the strength of their straw, a character which enables them to carry the tares well and at the same time to withstand the effects of high winds, the strong nature of their growth also facilitating the work of harvesting and stacking.

The first layer of the stack was comprised of rye-grass, which, like the oats and tares, was of excellent growth. The green material was all harvested with the reaper-and-binder, a method which largely removes from silage its chief drawback—the cost of stacking it.

In building the stack—the base of which measured 21 ft. by 15 ft.—rye-grass and clover formed the first layer, 6 ft. in depth. This was allowed to settle for a day, in order to permit the temperature to rise to about 130°. The stacking of the chief material, oats and tares, was then proceeded with without interruption. The temperature was carefully controlled. This was ascertained by means of a galvanized inch iron pipe reaching to within 3 ft. of the bottom of the stack in which a thermometer was suspended by a piece of string. The temperature may range between 130° and 150°. Mr. W. Dibble, Instructor in Ensilage to the Department, emphasized the importance of controlling the temperature, as if it is known that the stack is of the desired temperature when completed the farmer knows with certainty that the silage will be successful. On each layer of a foot of the green material coarse agricultural salt was sprinkled at the rate of 2 lb. of salt to each ton of the green material. When the stacking was completed rough boards, 9 in. by 1 in., were laid on top. On these a framework was placed to hold the weighting matter—earth excavated from the ends of the stack, the earth being carried to the top of the stack in boxes elevated by means of Manitoba hay-stacker. When completed the stack contained about 45 to 50 tons of green material, and this should produce about 40 tons of silage.



MAKING THE SILAGE STACK AT MARTON JUNCTION WITH THE MANITOBA HAY-STACKER.

MARTON EXPERIMENTAL PLOTS.

BRIEF SUMMARY OF WORK UNDERTAKEN.

G. DE S. BAYLIS.

THESE plots are being used to definitely test varieties of wheats, oats, and barleys recently introduced by the Department of Agriculture from

Australia, Sweden, Canada, England, and other parts of the world. While giving a preliminary test, endeavour is also made to harvest a certain amount of seed, so that during the season following tests of such varieties as seem worthy of further trial may be made, by means of co-operative experiments upon a more extended scale in various parts of the Dominion.

The plots are not given up entirely to cereals. Last season several varieties of peas were grown in order to prove that peas of good quality and colour, suitable for the export trade, could be grown there. Maizes of many kinds were also then grown, and a few are again being grown this year, as well as millet and sorghum, for the making of stack ensilage later on. Other new forage plants, such as Helianti, are being tested, as well as Soya beans, Velvet beans, Buda kale, American kale, and suchlike, and the work is being carried out under ordinary farming conditions, and with the usual implements.



THE OAT AND PEA CROP AT MARTON.

This season the Marton plots have supplied, from last year's harvest, several small samples of newly introduced varieties both of oats, peas, and wheats for co-operative-experimental purposes in other parts of the North Island; and, by their means, a continued supply of these varieties has thus been assured until a true verdict can be returned upon their values by the testing of the crops in different parts of the Dominion grown from seed which has been acclimatized in this country.

It was somewhat late in the year before the Department was able to start operations last season; consequently, there was only time to plough the land out of oat-stubble and put in the crops. This season, however, most of the cereal plots were ploughed in March, and cross-ploughed in June, and sown in July. After the second ploughing, very little harrowing was found necessary. The value of the early and also of the second ploughing is proved by the appearance of the crop.

Another point it is hoped to demonstrate is the value of including a leguminous crop in the rotation. On plot 20, last season, maize was grown, and on plot 21 blue imperial peas. This season a variety of wheat imported from Sweden, and known as "Grenadier," is growing on both plots, and, at the date of writing (22nd December), markedly shows the value of the pea crop as a soil-renovator.

Lime, used in the form of carbonate, at the rate of 5 cwt. per acre, has given good results, and on plot 13, the half of which had received some lime last season, vetches were noticed to be plentifully distributed amongst the oats, whereas on the unlimed portion they made little growth, and had a sickly appearance.

Vetches and oats, grown as a mixed forage crop, for use either as green feed or for ensilage, as grown on plots 11, 12, 13, demonstrate the value of this crop for the dairyman, filling the gap before the maize is ready, and being one of the earliest crops ready for feeding or for the silo.

The use of the vetch greatly improves the soil for the crop which is to follow. The Beardless Propsteier oats on plot 12, averaging from 5 ft. 10 in. to 6 ft. 4 in. in height, yielded $17\frac{1}{2}$ tons of green fodder. The Triumph oats on plot 13, averaging from 5 ft. 10 in. to 6 ft. 4 in. in height, yielded $15\frac{3}{4}$ tons of green fodder. Victory oats, on plot 11, averaging 5 ft. 4 in. to 5 ft. 10 in., yielded 16 tons green fodder. These varieties were selected as specially suitable for growing mixed with vetches as a mixed forage crop on account of their abundance of leaf and the strength of the straw, which, by supporting the vetches and standing upright in all weathers, renders it possible to harvest the crop with the reaper-and-binder at a nominal cost for labour.

The other acre that was used for ensilage was composed of a mixture of prairie-grass, Italian rye-grass, and red clover. It is in its second season, and particulars as to its treatment can be seen by referring to the tabulated statement.

Among the wheats being grown this season are: Australian—Yandilla King, John Brown, Comeback, Federation; Canadian—White Fife, Red Fife, Imperial Amber, Turkey Red; Swedish—Swedish Pearl, Grenadier; New Zealand—Hard Straw Tuscan, Red Tuscan. Among the oats—Triumph from England, and Beardless Propsteier and Victory from Sweden. The barleys comprise—Swan-neck and Hennchen from Sweden, and White and Black from Russia.

As a record is kept as to the treatment each plot has received since the land was taken over, it both is and will be interesting to note the effect made upon the present crop by those preceding it; and it is surmised that this interest will grow as time elapses, and still more marked differences will become apparent.

In addition to the variety trials now being undertaken, in course of which many new varieties are being introduced to the notice of the farmer, and from which a supply of seed for next year's trials will be obtained, the experiments at the Marton plots have so far demonstrated the benefit derived by the application of so small a dressing as 5 cwt. of lime; that the use of lime in the form of fine ground limestone is beneficial, more easily handled than burnt lime, and costs less; that by growing a leguminous crop, such as peas, the farmer not only harvests a money-producing crop, but that he also adds a valuable manure to his land at no cost to himself; that late autumn ploughing,



THE EXPERIMENTAL PLOTS AT MARTON JUNCTION. THE WESTERN ASPECT.

followed by cross-ploughing, is practically as economical on this class of soil as a single ploughing followed by the innumerable discings and harrowings then needed to fit the seed-bed, and is certainly productive of better crops; that by ploughing the country in fairly narrow lands better drainage is secured than where the lands are broad; that at certain seasons of the year, and with certain conditions of soil, the use of the Cambridge roller is a necessity to the production of profitable crops.

From the results obtained last season it would appear that all the Australian varieties hitherto tested come to maturity considerably before most of our New Zealand varieties. This is a distinct advantage where the farmer is delayed in preparing the seed-bed by inclement weather. This often happens on Marton soils, and, by the use of these wheats at such times, a crop could often be harvested when a late sowing with the ordinary New Zealand varieties would preclude success. The need of a far-heavier sowing when using the Australian varieties, especially as regards Comeback or Federation, is also indicated. These varieties carry very little flag, and need therefore less room; and the thicker sowing seems likely, from present experiments, to be about to yield a heavier crop. Federation, a short-straw variety of considerable strength, has earned a reputation for remaining erect upon strong soils, and also in spite of heavy storms. Comeback, the earliest of all the wheats yet tried to come to maturity, has, for the past two seasons, obtained the highest number of points on the analysis made of the milling qualities of a large number of varieties grown both in the North and South Islands, and specially tested for that purpose at



LOOKING TO THE NORTH.

Brisbane by Mr. J. C. Brunnich, of the Queensland Agricultural Department. Two other varieties also, Power's Fife and Jonathan, have so far given very satisfactory results upon a certain class of soil in the Rangitikei district; and Federation, Comeback, Yandilla King, Power's Fife, and Jonathan are all now being grown, both by the original experimenter as well as by other farmers, on a considerably extended area, and sown with the seed harvested from the original bushel supplied for co-operative-experimental purposes.

REQUIREMENTS OF MARTON JUNCTION SOILS.

The soil on the plots is a stiffish loam of no very great depth, upon a tenacious yellow clay. Such soil needs draining with the mole-plough, and also requires that the subsoil should be stirred, not brought to the surface, and that lime be applied and worked into the surface of the subsoil, as well as being mixed with the top soil—this to loosen and sweeten the latter, and render soluble the plant-food contained therein, to retain more moisture during periods of drought, and to induce plants to root deeper, and, by their residues in the soil, to gradually deepen the area of top soil proper: in short, to create two acres of cultivatable soil, one upon the surface, the other immediately below it, where only one acre of cultivatable soil existed before. By the inclusion of leguminous crops in the rotation, to accumulate nitrogen in the soil, to breed up the bacteria necessary to the production of good crops, and by the intermixing of fibrous matter with the soil—viz., the ploughing-under of crop residue, to induce more perfect drainage of the top soil, and at the same time to deposit



THE EASTERN ASPECT.

suitable organic matter therein. These are all alterations for the better which needs must take time to accomplish.

If the necessary implements and labour were available, it would be quite possible to so work the Marton plots that, while this process of advancement was in operation on certain plots, others should show Marton Junction soils retained in the same state as we find them to-day; while other sections, again, might, by altering the treatment and stinting the cultivation somewhat, be used to illustrate the results which must needs follow indifferent cultivation, and want of regard for a proper rotation of crops, and a suitable application of fertilizers. If, too, a careful record of the cost of all such operations were kept, such experiments might eventually be the means of proving that, instead of enlarging his holding by the purchase of more land (more superficial acres), the best investment the farmer can make of his capital is to obtain 4 in. or 5 in. of cultivatable soil immediately below the farm he already holds by draining his soil, and deepening it by thorough cultivation, proper rotations, liming, and the use of suitable fertilizers. Although such a demonstration must needs take a period of years for its accomplishment, it would be well worth the doing.

The table showing the particulars of the crops used for stack ensilage at Marton will be found on the following page.



FIELD PEPPERWORT (LEPIDIUM CAMPESTRE).

THIS is a European weed that is becoming very prevalent in the Kaiapoi and surrounding district. A good idea of the plant may be gained from the accompanying drawing, by Mrs. E. Bradshaw, of Rangiora. The flower is white, and grows like the flower of a carrot, or hemlock; the leaves are a pea-green. It spreads very quickly from seeds and from the root, the latter running along the ground like the Californian thistle. The only way I can see to eradicate it is by digging it out, cutting before it seeds and burning it, or by salting the patches. The latter would be rather expensive in some cases.—A. HUGHES, *Inspector of Noxious Weeds, Rangiora.*

MARTON PLOTS.—Particulars of the Plots used for Stack Ensilage, 22nd December, 1911.

Number of Plot.	Seeding.	Cost.	Previous Crop.	Date First Ploughing.	Cultivation following.	Date Second Ploughing.	Cultivation following.	Date sown.	Cultivation following.	Manures per Acre.	Cost per Acre.	Yield.
11	lb. 80 tares 55 Victory oats 23 rye-corn 27 tick-beans 185	s. d. 27 2	Wheat	March 15	Harrowed, March 30	Cross-ploughed, June 16	Harrowed twice, June 19	June 20	Harrowed, June 20	lb. 176	s. d. 13 0	16 tons green fodder.
12	121 tares 66 Propsteier oats	30 0	Barley	"	Ditto	Ditto	Ditto	"	Ditto	176	13 0	17.5 tons green fodder.
13	96 tares 64 Triumph oats	24 0	Wheat	"	"	"	"	"	"	176	13 0	15.7 tons green fodder.
31	26 prairie-grass 26 Italian rye 6 red clover 1910.	25 0	Oats	July, '10	Discd twice, Sept. 10	None	Harrowed three times, Sept. 10	Sept. 10	"	137½ L1 M	* 8 1	

* Previously limed with 5 cwt. lime-carbonate; cost, 4s.

1911, Sept. Top-dressed with 5 cwt. lime-carbonate and 1½ cwt. super. per acre, cost 11s. 6d.

Manure mixtures used for plots 11, 12, 13: 51 lb. blood, 9½ lb. sulph. pot., 23 lb. gypsum, 51 lb. Wanganui bonemeal, 40 lb. imported super.; total, 175 lb.

L1 Mixture used on plot 31: 27½ lb. blood manure, 55 lb. imported super., 41½ lb. Wanganui bonemeal, 13¾ lb. sulph. pot.; total, 137½ lb.

CULTIVATION.

RAPE.

PRIMROSE McCONNELL.

THE tendency of late years to limit the area devoted to the cultivation of this crop, on account of the ravages of blight, &c., is greatly to be deplored. For the sheep-farmer, no other forage crop can exactly fill its place; for the fattening of lambs it is unequalled; and few other crops leave the soil in better condition for the following crop. Under favourable conditions it will mature in eight weeks after the date of sowing. Last season, at the Moumahaki Farm, sheep were turned into a rape-paddock exactly six weeks after the seed was sown, and it was then a very fine crop, averaging 20 tons per acre. This was grown after a ploughed-under crop of crimson clover.

In my report on the rape crop at the Moumahaki Farm last season I ventured the opinion that blight, &c., to a great extent, might be avoided by early sowing. Rape is essentially a sheep-farmer's crop, and for the breeder of fat lambs early sowing is imperative, in order that his lambs may be carried on without check and got off his hands at the earliest possible date. By sowing late he courts failure in a double sense. In the first place his rape crop will not be available when it is most urgently required, with the result that a considerable percentage of his lambs will be left on hand as stores, and sold as such at a comparatively reduced price; and, in the second place, he is safe, in nine seasons out of ten, to strike a dry time, which in any case will reduce the bulk of his crop, render it more susceptible to attacks of every kind of parasite, and may end in entire failure. My opinion as to the great advantage of early sowing has been further confirmed by the success of this year's crop at this station (Ruakura), which, although grown under the most adverse conditions as to soil and weather, was quite fit for consumption by the middle of December, with the result that lambs not already sold fat are being carried forward without a check, and it may be reasonably expected that practically every lamb will be fat by the end of January.

When rape is grown by the dairy-farmer, he requires it in the dry season, and on that account it is necessary to sow later. It has been proved, however, that the dairy-produce resulting from the consumption of rape is inferior; also that there are other crops more certain as to their success in a dry season, producing a greater bulk

of forage per acre, and butter and cheese of much better quality; hence the dairy-farmer may ignore this crop entirely without loss to himself.

If what I have stated above is accepted as correct, then not a single argument can be brought forward to prove the advantage of late sowing. Early sowing has everything in its favour; late sowing has nothing whatever. When sown early, sufficient rain to force the crop to maturity is assured, and blight is avoided. In the cultivation of early rape, sowing on raised ridges is absolutely essential, as the young plants are kept comparatively dry during a wet time, also horse-hoeing may be undertaken at a time when it could not possibly be done if the crop were sown on the level. The great advantage of sowing any early forage crop on raised ridges has been abundantly proved this season, which up to now has been abnormally wet and cold. Many paddocks of mangels, for instance, sown on the flat are now nothing but a mat of weeds, and their ultimate failure is inevitable. Even when sown on ridges, weeds in the rape and mangel crops have this season been held in check with the greatest difficulty; on the level, successful cultivation has been impossible.

Like every other forage crop, rape revels in soil that is full of humus; hence the greatest success may be expected if grown as the first crop after pasture. At the same time, under good cultivation, and if suitable manures are applied, it may be successfully grown after any crop. On soils that contain a maximum of lime, rape may follow rape, but such a course is not advisable, and will lead to the introduction of club-root disease, which is the greatest enemy rape has to contend against. Without going into detail as to cultivation, the following rules may be safely advocated:—

Plough early, and as deep as the subsoil will admit.

Cultivate at intervals between the dates of ploughing and sowing, so as to aerate the soil and keep down weeds.

Make the seed-bed as fine as possible, and roll before ridging so as to ensure a firm seed-bed.

Sow the seed from the middle to the end of September, at the rate of $2\frac{1}{2}$ lb. to 3 lb. per acre, on raised ridges 27 in. apart.

As soon as weeds appear, set the horse-hoe agoing, and hoe at intervals until the crop is meeting in the rows. If the weeds are kept down between the rows, the crop will smother the remainder.

If the Planet Jr. is used, the last hoeing should be done with the side hoes reversed so as to form a ridger, and thus throw up fresh soil to the stems of the rape, which not only smothers the weeds but also encourages the growth of the plant, and gives a finished appearance to the whole paddock.

As to fertilizers: where the soil is infested with blights and club-root, do not use a highly soluble superphosphate; use instead a

high-grade slag, or basic superphosphate. A mixture of bonedust and slag will also give good results. On soil that is not subject to club-root, and when seeds and manures are sown at one operation by the double ridger, I would recommend basic slag and superphosphate, the former sown through the manure coulters, and the latter through the seed coulters. As a rule, the guanos now on the market are too slow in their action for this crop, and the specially prepared fertilizers, generally speaking, cost more than they are worth. Potash may be added to phosphatic manures for light soil; on clay soils it almost invariably does harm. Only in very exceptional cases will nitrate of soda or sulphate of ammonia pay the cost of application.

It will pay handsomely to eat down the first growth of the rape crop only; allowing it to make a second growth and plough under. Up to the present, the Essex varieties have given the best results, with the Kangaroo a good second. None of the kales fatten so quickly as rape, but of all the forage crops of this class Thousand-headed kale is undoubtedly the best blight and drought resister.

The mistake is often made of allowing the rape crop to become too mature before turning sheep on. It is then woody and unpalatable, and is not eaten with any relish. A little mustard should be sown with the rape to act as a corrective, and stock while feeding on it should have access to a supply of rock salt.

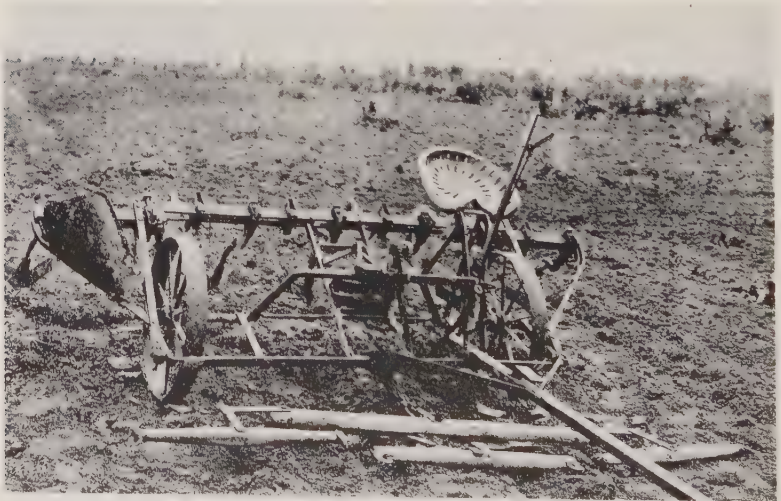
BASIC SLAG.

THE Ruakura Farm of Instruction has conveyed many important lessons in the past as to value of basic slag as a manure for the soils of the Wai-kato, especially in the top-dressing of pastures, and this season again further demonstrations of its value are being furnished. A striking example of the application of slag in the manuring of mangels is provided. Two rows in the mangel crop were left unmanured, while the rows on either side were treated at the rate of 5 cwt. of slag and 80 lb. of potash per acre. The effect is outstanding. In the unmanured rows few plants germinated, and these are of a stunted character. On the basic slag rows the roots germinated well and show splendid development. While the slag has made this fine showing it is only fair to say that basic superphosphate promises to give the best result. This experience is a repetition of that at the Moumahaki Experimental Farm last season.

It is a common misconception that basic slag is slow in action. The experience at Ruakura and other farms of the Department emphasizes the incorrectness of this view. As a matter of fact, basic slag is generally just as quick in action as superphosphate. It is practically instantaneous in its action, either on pasture or root crop, but whether this effect is mechanical or chemical is not known. The use of superphosphate will give a larger bulk of crop and a heavier tonnage of roots, but the feeding value will not be so high as where basic slag has been the stimulating agent. It has been proved that the greater acidity of superphosphate encourages club-root disease, while basic slag has the opposite effect.

AN ORCHARD-CULTIVATOR.

IN cultivating an orchard it is not always an easy matter to work the land well up to the trees. The usual procedure is to employ a four-horse cultivator adapted for the special purpose, and drawn by two horses. The centre tines are first of all removed, and the two sets of extension tines are used to cultivate close up to the trees. Then the extension tines are taken off and the centre one attached for working the ground in the centre. Of course, there are extension discs for orchard work, but these are not suitable for all classes of land. To make the ordinary cultivator effective, and at the same time economize in time and labour, an idea has been adopted by the Manager of the Waerenga Experimental Farm. This is herewith illustrated. It will be seen that the pole and the seat have been shifted to one side, extra stays being employed from the frame to the seat, which gives the necessary rigidity. The draught, however, is still taken from the centre of the implement, a three-horse equalizer being attached to the front and centre of the frame by means of a chain. This allows the implement to cut well underneath the trees without the branches of these being damaged. A cultivator so constructed does the necessary work between two rows of trees at the one operation.



THE IMPROVED ORCHARD-CULTIVATOR AT WAERENGA EXPERIMENTAL FARM.

REVEGETATING EXPERIMENTS ON DEPLETED COUNTRY.

SAWDON RUN, MACKENZIE COUNTRY.

A. MACPHERSON.

THE following particulars are compiled from a report furnished by Inspector Manning, Fairlie, dated the 13th October, 1911 :—

EXPERIMENTS INITIATED 20TH OCTOBER, 1910.

Trial Tests of Grasses and Fodder Plants.

Plot.	Variety.	Remarks.
1	Cocksfoot	Doing very well.
2	Smooth-stalked meadow-grass	Very little to be seen.
3	Chewing's fescue	A few plants, but not doing well.
4	Hard fescue	Very "
5	Sheep's fescue	Very poor.
6	Red fescue	"
7	New Zealand oat-grass	No signs.
8	Prairie-grass	Making a fair growth.
9	Birdsfoot trefoil (minor)	Doing very well; has made good growth during the spring.
10	Fiorin	None to be seen.
11	White clover	Doing splendidly.
12	Crested dogstail	Only a few plants; poor.
13	Chicory	Making a good growth; has taken possession of the plot.
14	Yarrow	Doing well; a good many plants.
15	Awnless brome-grass	Doing well; a good many plants, some being 8 in. high.
16	Sheep's burnet and sainfoin	Doing splendidly; has made a remarkable growth.
17	Bokhara clover	Doing fair; a good many plants.
18	Kidney-vetch	The plot is covered, but plants appear stunted.
19	American red-top grass	No signs.
20	Tall oat-grass	A few plants; has made a fair growth.
21	Wavy or zigzag grass	No signs.
22	Sweet vernal, true	"
23	Sheep's parsley	A few plants, and these doing well.
24	Various-leaved fescue	None to be seen.
25	Lucerne	Doing splendidly; the plot is covered with plants, and these are making a good growth.
26	Rhodes grass	Evidently killed by frost.

Mixtures of Grasses, &c.

PLOT 1 (SURFACE-SOWN).

A few plants of chicory, sheep's burnet, cocksfoot, and white clover are showing up, but no signs of the other grasses sown.

PLOT 2.

Chicory, sheep's burnet, cocksfoot, white clover, and birdsfoot trefoil (minor) are doing well on this plot. The plot is well covered, and is looking vigorous and very healthy.

PLOT 3.

Fescues: Various-leaved, Chewing's, sheep's, and red. There are a good many plants, but growth is very poor.

Grasses planted in Drills.

Variety.	Remarks.
<i>Festuca dumetorum</i>	Doing very well; has made a growth of 3 in.
<i>Phalaris commutata</i>	Stood the winter well, and is strong and healthy.
<i>Phalaris canariensis</i>	Strong and healthy; stood the winter well.
Rhodes-grass, Buffalo-grass ..	Only a few plants; evidently dead.

With regard to the regrassing experiments initiated last March on the Sawdon Run, Inspector Manning reports that the date of his inspection, 13th instant, was rather early in the season to report definitely regarding these, but that nearly all the grasses had come away.



WERARUA EXPERIMENTAL FARM.

The visitors' quarters (in the foreground), the office, and the accommodation house for employees.

W E E D S .

T. W. LONSDALE.

AGRICULTURE is probably the most natural of all sciences, yet in its practice much is embraced which is essentially artificial. Evidence in support of this assertion may be adduced by a cursory view of the system adhered to in the cultivation of arable land. In this work, instead of supporting nature and allowing her to work out changes in her own time, it is necessary, in the successful raising of crops, to work almost in direct opposition. No farmer, when allowing a piece of land to lie fallow for a season, would expect at the end of that time to be able to reap a crop of oats, but there would inevitably be an abundant crop of weeds derogatory to his interests.

The soil is the foundation of agriculture, therefore the first and best attention of every agriculturist is to clear the land of weeds, otherwise he cannot reasonably expect to raise profitable crops.

DEFINITION.

The question is often asked, What is a weed? and the many attempts made to answer it, though in a sense successful, are lacking in precision. A weed may be termed a plant out of place, or a plant growing naturally among a crop which has been sown, but differing from this crop and hindering its growth. Briefly, all undesirable plants, wherever they may be found growing, may safely be classed as weeds.

DISTRIBUTION.

It is not only found that most weeds have restriction of growth and development on special classes of soils and with special degrees of fertility of land, but it is noted that in many cases, where land is converted from a state of nature to arable cultivation, plants which had previously flourished entirely disappear, and are superseded by others of different habits which apparently are better able to adapt themselves to the prevailing circumstances.

How is it that the latter now make their appearance, or why do those which previously predominated now disappear? To enable these questions to be answered it is necessary to closely observe the habits of the various species and make a division according to duration—*e.g.* (1) annuals, (2) biennials, (3) perennials.

Annuals are those which complete their life-history in one year. From the seed which germinates in the spring a fresh supply for the carrying-on of the species is produced before the end of the first season. Such are chickweed, spurrey, and groundsel.

Biennials during the first season throw out luxuriant foliage and develop a strong tap-root, the second season being entirely devoted to the process of reproduction. The resources accumulated during the first season are drawn upon for this purpose. Examples are species of docks and ragwort.

Perennials are weeds which live more than two years. The foliage of these dies away each autumn and appears the following spring, being propagated by buds which are found on the underground stems. Canadian thistle and corn-bindweed are examples.

It is now necessary to consider the altered conditions of the soil brought about by cultivation. Assuming the land was previously virgin pasture, there was then a compact surface layer, giving the plant a thorough attachment to the soil, and also preventing excessive escape of moisture, whilst on ploughed land the reverse holds true.

The conditions of the ploughed land favour annual weeds, whilst the perennials would be more adaptable to the virgin pasture; and probably a few biennials would be found in both places. We may therefore safely assume that the altered soil conditions are responsible to some extent for the distribution of weeds.

INJURY DONE BY WEEDS.

No one will deny that the injury caused by weeds is enormous; and if an estimate of the annual loss to the country incurred by the growth of weeds could be given the result would be astounding.

On arable land the amount of water taken up by weeds and evaporated from the surface of the leaves is very great. This is considered by many to be the most serious injury done by weeds. Not only do they absorb a large amount of moisture, but they also rob the crop to a great extent of the available plant-food; and it is often noticeable that weeds grow more vigorously than useful plants, in some instances completely destroying the desired crop.

Eradication differs according to the species to be dealt with, but in the treatment of all weeds a stitch in time saves nine. Prevention of seeding wherever possible, the destruction of any weeds that are already existent in the soil, and the prevention of the introduction of more weeds by seed or otherwise, are cardinal points to be strictly observed. By strict adherence to these the writer is confident that a few years hence the progress made in the extermination of weeds will astonish the most pessimistic person of to-day.

CHOU MOELLIER.

THE photograph below illustrates a very promising crop of chou moellier at Ruakura Farm of Instruction. It also provides an excellent example of the work that may be done by a double ridger in the hands of a skilful workman. The rows, 420 yards in length, have been, as may be seen, taken with singular uniformity. Mr. McConnell, the Manager of the farm, thinks a great deal of chou moellier as a fodder crop. It has stood the test of rough and unfavourable weather better than the maize (which had to be resown), millet, Soya beans,



THE CHOU MOELLIER CROP AT RUAKURA FARM OF INSTRUCTION.

mangels, carrots, and cow-peas planted in the same field. Though plants of the cabbage tribe, of which chow moellier is a member, are supposed to require abundant humus, the crop in question has made splendid progress in a field where humus is practically non-existent. Mr. McConnell does not agree with the advice as to time of feeding the French cow-cabbage usually given—that is, when fully matured. He thinks the plant should be fed before the stalk becomes woody, so that the whole of the plant is palatable to stock, instead of when the plant is allowed to mature, having then only the leaves available.

Again, when fed before being fully matured, the plant will not have taken so much out of the soil. He believes that sheep would do well on chou moellier if turned on in the younger stages of the plant's growth. An advantage of chou moellier is that it may be planted as early as September. In cultivation the plant should be treated as an ordinary root crop, the individual plants being singled out to not less than 2 ft. apart, the rows being 30 in. wide. The crop illustrated was manured at the rate of $2\frac{1}{2}$ cwt. of basic slag, 2 cwt. of bonedust, and 50 lb. of sulphate of potash per acre. This is not a heavy dressing for the land in which the crop is growing—a heavy loam, rather poor in character, and resting on an iron pan, which in places comes nearly to the surface. Experiments in regard to the feeding-value of chou moellier are to be conducted at Ruakura. Two acres are under the crop this season.

MILK-RECORD AYRSHIRES.

THE steamer "Delphic," which arrived in Wellington on the 5th instant, brought from Scotland for the Ayrshire herd of the Moumahaki Experimental Farm a bull and six heifers. The cattle were selected by Mr. James Dunlop, the Scottish Agricultural Commissioner who visited the Dominion last year. Mr. Dunlop is one of the foremost men in the campaign for developing Ayrshire cattle according to a pedigree of performance, and in selecting the stock for the Moumahaki herd he attached primary importance to milk-record quality, the animals being purchased from owners of the best deep-milking herds in Scotland. The valuable group of utility dairy stock arrived from Scotland in excellent order.

"It will not be doubted that, with reference either to individual or national welfare, agriculture is of primary importance. In proportion as nations advance in population and other circumstances of maturity this truth becomes more apparent, and renders the cultivation of the soil more and more an object of public patronage. Institutions for promoting it grow up, supported by the public purse; and to what object can such funds be dedicated with greater propriety?" —*President Washington, in his annual message to the American Congress in 1796.*



MILKING-TIME ON A DANISH DAIRY FARM.

THE FEEDING OF COWS.

AN EXPERIMENT TO TEST THE EFFECT OF DRY FEED
DURING THE SPRING MONTHS.

PRIMROSE MCCONNELL.

DURING spring, when grass is in the full flush of its growth, the cows at the Ruakura Farm of Instruction suffer from abnormal purging, which is something more than the ordinary "spring cleaning" provided by nature. In order to test whether a dry ration would to some extent prevent the excessive scouring, and possibly increase the yield of milk, an experiment, lasting forty days, was carried out during October and part of November. Thirteen cows in their full flow of milk were selected. During the winter months the cows had a liberal supply of good hay, but when grass became plentiful the hay was ignored. For the latter, a small ration of oatsheaf chaff was then substituted, which was eaten for a few days and then refused. The chaff was then gradually reduced, and a little bran added until the quantities were about 2 lb. each of bran and chaff. This quantity was the most the cows could be enticed to clean up without waste. On the 5th October the ration of chaff and bran was withdrawn, and for ten days the cows in question subsisted on grass alone.

In weighing the milk the first three days of each ten were not recorded, so that the effects of previous feed would be entirely eliminated. The weather during the experiment was more or less wet and stormy.

The following table gives the result:—

Total Milk-yield from Thirteen Cows.

For Seven Days previous to withdrawing Chaff Ration.	From Oct. 5 to Oct. 12, on Grass Feed only.	From Oct. 16 to Oct. 23, on Grass Feed plus 2 lb. Bran and 2 lb. Chaff.	From Oct. 26 to Nov. 2, on Grass Feed only.	From Nov. 6 to Nov. 13, on Grass Feed plus 2 lb. Bran and 2 lb. Chaff.
2,710 lb. Purging slightly.	2,696 lb. Purging badly.	2,685 lb. Purging slightly checked.	2,690 lb. Purging in- creased.	2,661 lb. Purging con- siderably checked.

Summarizing on the above, it must be at once admitted that, as far as this experiment is concerned, the addition of dry feed to a full ration of good grass was without appreciable result as to the milk-yield. On the other hand, it would only be natural to draw the conclusion that this small

ration of dry feed, costing about 1s. per cow per week, if carried right through the spring months, would more than pay, in the end, by keeping the cows in a healthier state, and hence in better condition to face the following milking-period, particularly in such low-lying localities as this, where the winter and spring months are often excessively wet.

Where no supplementary home-grown fodder, in the shape of maize, &c., is available to supply the lack of grass during summer, a ration of bran would undoubtedly increase the flow of milk; but the above experiment only confirms the conclusion that has already been drawn by many British dairymen—namely, that if a cow has an abundance of good wholesome feed, such as grass, the quantity of milk (and certainly the percentage of butter-fat) cannot be profitably increased (the latter not at all) by the addition of artificial feed: also, that a finely balanced ration is not of such importance as theorists would have us believe.

Professor McConnell, who is perhaps the greatest living authority on dairy matters, in a recent article makes the following statement: "Never mind bothering about albuminoid ratios, and calories, and all these kinds of things—they are very useful to write about in text-books, and to set questions upon at examinations; but the point is this: What is the irreducible minimum in food on which my best pet cow will give her biggest yield of milk? If I give her plenty of hay and roots, does she want any cake as well? It is perfectly certain she will be healthier without any concentrated food at all."

The professor also states that at one time he gave a daily ration per head of 10 lb. of cotton-cake, bean-meal, bran, &c. Lately he has reduced the quantity to 3 lb. per head, with a much increased net profit. He further states: "Indeed, at the moment this article is being written, my supply of cotton-cake has given out, but a herd of sixty cows has only dropped 3 gallons daily in the total, and I am seriously wondering if it pays to give any cake or meal at all."

I may state that my own experience in England was similar.

In using the word "artificial," I refer to food not grown on the farm and which is supplied in addition to a *full* ration of home-grown feed. When the foodstuffs grown on the farm are not sufficient, they must, of course, be supplemented.

A full ration of grass during spring and early summer, supplemented by fodder crops during the dry months, and during the winter a liberal supply of first-class hay and a few mangels, will, under ordinary conditions, keep the average cow in healthy condition and in good milking-form the year round. For such localities as this, a good supply of well-got hay for the winter months is essential—lucerne hay for preference. A little bran should always be available on every dairy farm, as it may often be used medicinally, if not as a foodstuff.

A GREAT HORTICULTURAL EXHIBITION.



NEXT year a great event in the horticultural and fruit world is to take place in Belgium, in connection with the International Exhibition of Ghent. In addition to the quinquennial show of the Royal Agricultural and Botanical Society of Belgium, it is expected that the special exhibition of fruits, vegetables, and chrysanthemums from all parts of the world will constitute the most comprehensive and representative horticultural display ever made. The display will take place in a fine palace (illustrated) covering over 5 acres, being specially built, and which will remain in the public park of Ghent as a permanent home for the horticultural displays for which Belgium is famed.

SOFT-CHEESE MAKING.

MISS G. NEST DAVIES, N.D.D.

REQUIREMENTS OF THE DAIRY.

IN the manufacture of soft cheeses which are to be eaten fresh one room only is necessary. This room should be provided with suitable means for regulating the temperature and keeping it equable. Where the ripened varieties are required a second or ripening room is required; and, if space is available, it is advisable that a third room may be set apart as an intermediate or drying room for drying the cheeses before their removal to the curing-room.

The curing-room should be fitted with latticed shelves on which the cheeses may be placed upon straw and have air freely circulating round them. The temperature should range between 50° and 60° Fahr., according to the particular variety to be ripened.

It is essential that newly made cheese should be kept for a time in a room where pure dry air is in circulation, otherwise they may develop a slimy coat and become almost worthless in consequence. Where soft cheeses are kept for some considerable time they are put into cold stores. By adopting this plan such cheeses may be kept in good condition for a considerable time.

UTENSILS AND APPLIANCES.

Those needed are of a simple character and by no means costly, so that for a comparatively small expenditure the dairy may be well equipped. The requirements are as follows: A jacketed vat, or, if only very small quantities are required, an oak setting-tub, thermometers, rennet-pipettes or measuring-glasses, ladles for slicing the curd, linen cloths and butter-muslin, a draining table or shelves, wooden draining-racks, moulds, boards, straw mats, salt, grease-proof paper, chip or cardboard boxes, and the usual requirements for dairy-work in general, such as a plentiful supply of hot and cold water, wire strainers, measures, pails, brushes, &c.

Thermometers.—A wall-thermometer should be hung up in each room to record the temperature of the air, and a floating-thermometer is required for use with the milk. It is of great importance to have accurately graduated thermometers for regulating the temperature of the milk, as, if set at even one or two degrees too high or too low a temperature, a very considerable difference is noticeable in the curd produced.

Rennet.—This is a preparation obtained from the fourth stomach of the calf, which is known to the cheesemaker as a “vell.” Home-made rennet is seldom satisfactory; its use is not advised, as it is weak and quickly goes bad. Reliable rennet-solutions which are very strong and concentrated can easily be obtained, and are used by the most successful soft-cheese makers in England and France. These solutions should always be kept in stone jars, as the action of light weakens rennet. They should also be kept in a cool room, to prevent decomposition taking place. Bad rennet may be recognized by its disagreeable odour and a turbid appearance. It should be clear and of a light-brown colour. Rennet-solutions lose strength on keeping. They may be obtained as powder and as tabloids. Both are dissolved in water for use. These commercial preparations of rennet are specially valuable for small dairies, as they do not deteriorate when stored. For this reason they are largely employed in hot climates.

Pipettes or Measuring-glasses.—Owing to the very small quantities of rennet that have to be measured out, it is necessary that some system should be adopted which will ensure accuracy. For this purpose a pipette showing cubic centimeters (c.c.), or a measuring-glass, in which the dram is divided up into minims, is required. 17 minims = 1 c.c.; 3.55 c.c. = 1 dram; 8 drams = 1 ounce.

Draining-cloths.—These are required of fine, medium, and coarse texture. They should be made of linen of about a yard square.

Draining-table.—This should have a slight slope and be provided with a grooved channel for the whey to escape. It may be constructed of sound hard wood, such as may be readily cleaned, or have for a top slate or tinned iron.

Moulds.—Moulds made of tinned iron are preferable, as they are easily kept sweet and clean, though sometimes they are made of wood.

Boards.—These should be made from hard wood which will impart no flavour to the cheese placed upon them to drain, and should measure 14 in. by 8 in., and should be about $\frac{1}{2}$ in. thick.

Straw Mats are made by threading together pieces of tough, stiff straw, rye straw generally being used for the purpose.

Salt.—Good salt, as for buttermaking, is very essential in soft-cheese making. It should be soft, free from grittiness, and readily soluble.

“Let us never forget that the cultivation of the soil is the most important labour of man.”—*Daniel Webster*.

APPLE - PACKING .

GEO. STRATFORD.

ONE of the most important factors in the successful marketing of fruit is the proper packing of it. Every fruitgrower is fully aware of the fact that the orchard should be kept in good condition with regard to pruning, spraying, and cultivation, and that only first-class fruit should be grown. It is of very little use attending to all these details, however, if, having produced the first-class fruit, strict attention is not paid to the packing of it. When I say that the packing should be a matter of first consideration, I mean that, no matter how fine a grade of fruit we have, unless it is put up in the way it should be the fruit—owing to rough handling and travelling probably for long distances—will not be in first-class condition when it is placed on the market. The apple-consumers of the world are demanding that the fruit be placed before them in a uniform manner and attractive in style. The country that does not go ahead and keep up to date in these respects will soon find itself in the background. Growers should by all means educate themselves to the method of packing the fruit they grow. It is one of the most important lessons to be learnt in the apple-growing industry. Countries that have been exporting apples for a number of years have changed their styles of packing considerably. We in New Zealand, where the export trade is only in its infancy, should benefit by the experience of other countries.

PICKING.

It has been said that the packing of a first-class commercial pack really begins in the orchard. That, of course, refers to the picking of the fruit. Growers work the whole year round to produce a good crop of fruit. Why then sacrifice any per cent. of it by rough handling in picking? Many growers do. Apples should be handled as carefully as eggs if we wish them to be in first-class condition when placed on the market. Bruises on apples whilst picking may not show until after being packed. When picking this season's crop it should be borne in mind that there are crops to follow, and the fruit-spurs that are knocked off by careless picking will not produce apples next year. Fruit may also be picked too green, resulting in shrinkage after packing; while, on the other hand, if allowed to remain on the

tree too long it will not keep so well. Generally speaking, fruit is ready to be picked when the stem separates from the tree easily. The exact time to pick fruit cannot be described in words: it can only be learnt in the orchard. Some growers use the packing-boxes to pick their apples in. This should not be, as the boxes get more or less dirty, and therefore spoil the look of the packed boxes. In my opinion, the best plan is to have orchard-boxes into which the fruit is placed after picking from the tree, using either a pail covered inside and outside with felt, or one of the several kinds of picking-bags that are now on the market. The fruit should be hauled to the packing-house in a low wagon, thus making loading and unloading easy.

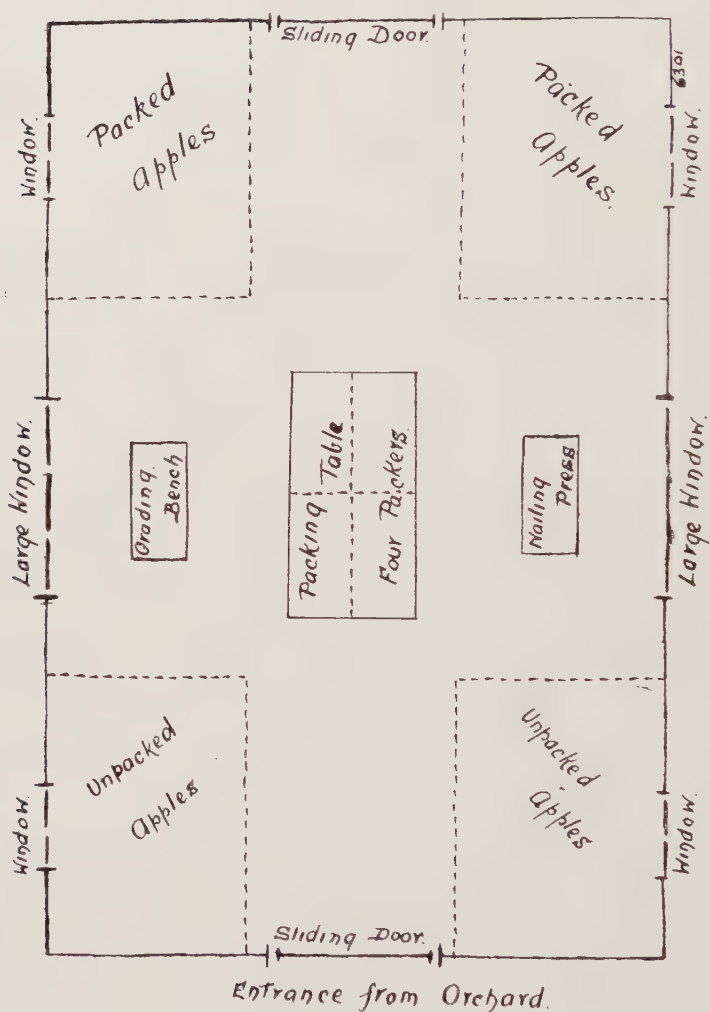
PACKING-HOUSE.

One of the most essential requirements for handling the fruit crop to the best advantage is a proper packing-house. This is too often dispensed with by growers, who make shift to pack in the open air, where any inclement weather brings packing operations to a close, and the packers are subjected to much discomfort. The size of the packing-house must depend on the size of the crop to be handled and the quantity of fruit stored in the house at one time, but it should be roomy enough to meet all requirements, such as the storing of unpacked and packed fruit in case apples are kept over for an advance in market values. It should be well ventilated, and, above all, have plenty of windows to give a good and sufficient light, for no packer, however expert, can do high-grade work in a poorly lighted room. The comfort of the packers has a direct effect on the quality of the pack, and from a purely business standpoint is worth securing. Whatever size packing-house is agreed upon, it should be about half as long again as it is wide. The building should be of wood and galvanized iron with a stone foundation, having a double floor if no cellar. If there is to be a cellar one floor is sufficient. A cellar is to be recommended, as it is valuable for the precooling of fruit, thus retarding the process of ripening, and is also useful for storing box material, paper, &c. The cellar should be reached by an outside door and trap-door in floor. The floor of the packing-house should be on the same level as the wagon bringing in loads of fruit from the orchard. This makes loading and unloading easier on the fruit. The sketch (on the following page) gives the floor-plan of a cheap yet efficient packing-house, showing position of windows, doors, packed and unpacked apples, &c.

PACKING-TABLE.

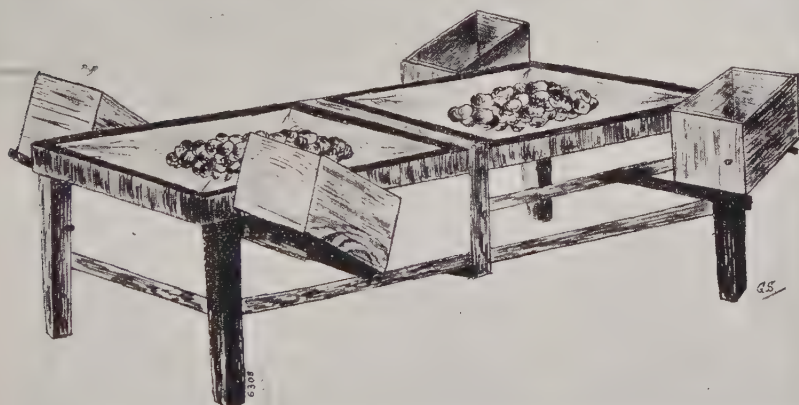
This is the most important piece of furniture in the packing-house. Many different kinds, some more elaborate than others, are in use, but,

generally speaking, the most simple is the most suitable. During the last few years the revolving table has come into great use in America. By means of this four packers can work at once, and four sizes of apples can be packed. This table is hardly necessary where the apples are graded—either by hand or machine—before being put in front of



the packer. Packers differ greatly as to the style of packing-table. In my opinion the most suitable table is the side table for four packers, placed in the middle of the room (as per sketch). This table gives plenty of room for the packers, and enables the table to be replenished with fruit without any interference with the packers. If the table is made

for four packers there are divisions put across so that each packer has a compartment to himself. The usual size for each compartment is 3 ft. by 4 ft., as this allows any part to be easily reached by the packers, and yet holds plenty of fruit. The top of the table consists merely of canvas, which is tacked on loosely, allowing considerable sag in the middle. All the apples should be packed off the tables once every hour to prevent bruises wearing on them. The danger of bruising may also be lessened by edging the table with canvas. The stand for holding the box in position whilst packing is simply two pieces of wood nailed on to the table at the proper angle. There are other kinds of stands, but convenience should be considered rather than style. In the



GRADING-TABLE.

Farmer for July there is a cut of a packing-stand which is very suitable. The only advantage gained in using the two pieces of wood is that no room is taken up compared with other stands, and in small packing-houses this has to be considered. The wrapping-paper is usually held in a frame attached to the box being packed, and can easily be taken off when the box is full; but however it is placed it should be in a suitable position so that no time is lost by the packer in picking it up.

NAILING-PRESS.

No packing-house is complete without a nailing-press. Several kinds are in use, but for a small orchard one can be made very cheaply. The press is very similar to an ordinary table, except that in the centre there is a depression into which the box fits. Two arms are

connected with a lever near the ground in front of the table. When the lever is depressed the two arms are brought down over the top of the box, holding the lid in position, and thus enabling the lid to be nailed on securely without any danger of bruising the fruit.

WRAPPING-PAPER.

Every apple in the pack should be wrapped. Paper 8 in. by 10 in. is adequate for all apples except the very largest, when 10 in. by 10 in. should be used. The paper has one side glazed or smooth, and the other rough, which is placed next the apple. The wrappers make effective cushions, help to retain the aroma of the fruit if stored, takes up slack in case of shrinkage, and also acts as an absorbent in preventing the spread of decay. They also impress the buyers with the fact that extra care has been given the product, and hence attract the best trade.

GRADING AND CULLING.

The grading and sorting of most fruit is done when the fruit is being packed, but the grading and culling of apples should be done before the packers begin their work. There are several types of grading-machines on the market. If too expensive, a slower yet simple device is by means of the grading-board, which is simply a plain board with holes in to assist the grower in sorting apples to uniformity of size. Great care should be taken with the culling of fruit, and no box of No. 1 apples should contain a bruised, wormy, stung, or limb-rubbed apple, or an apple that has scab, fungus, scale, or any other defect or disease that mars the appearance or affects the quality to any extent.

PACKERS.

Few growers are fit to pack their own apples, as it is too hard for them to see the defects. If possible it is best to employ the same gang of trained packers successively at the various orchards. This is the way to build up a reputation that has a real cash value. If four or more packers are employed there should be a foreman or head packer who is busy seeing that every box is properly and conscientiously packed, and in teaching and helping inexperienced packers. He sees that all are supplied with boxes, paper, and fruit, that boxes when filled are promptly removed, and that everything goes smoothly. Packers are generally paid by the box, and the price is set according to whether the apples are placed on the table graded or culled. Paying by the day would probably under wise management produce a better pack than by piece, since the latter method to some extent puts a premium on haste and carelessness. A great mistake is often made by packers just starting in trying to make the pace or keep up with a

more experienced packer. If this is done the box is usually packed very loosely, and the apples are not wrapped properly in the papers. Speed can only come with practice, and can hardly be expected from a packer until he has had at least one full season at it. All men do not make good packers. I have seen some trying year after year and have never been successful, while others pick it up very quickly, and in a short time produce a good pack. Most packers have a rubber finger-stall on the first finger to assist them in picking up the paper quickly. In some parts of America all lady packers are employed. Although somewhat slower, they are usually more careful and conscientious than men packers.

STYLES OF PACKING.

As before stated, the styles of packing have changed considerably during the last few years. Of the better class of packs in which each apple is put individually into place, the two most commonly in use at the present time are the (*a*) straight or square pack, (*b*) the diagonal



Three.



Four.

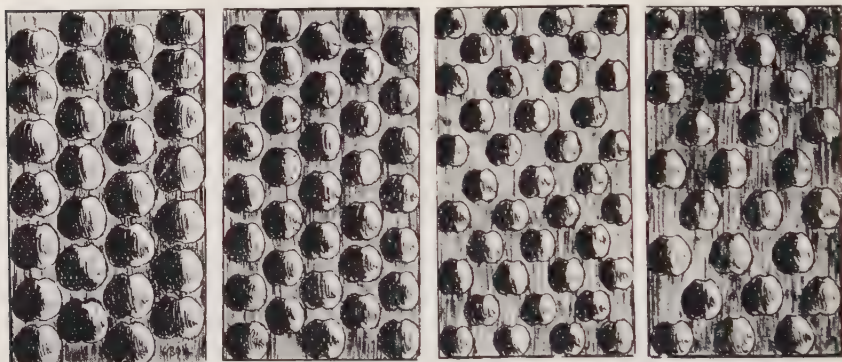


Five.

STRAIGHT OR SQUARE PACKS.

pack. The straight or square pack is made up of rows running straight across the box, and probably presents the neatest appearance of any, but at the same time is hardest on the fruit, as each apple is squarely opposed to its neighbour instead of slipping into the recess or pocket between them, as in the other style. The different kinds of square pack are the three, four, and five. This pack is largely used for exhibition purposes, but for the export trade is suppressed as much as possible for the diagonal packs. The diagonal pack is so called from the diagonal or oblique course taken by the rows. It should be used in preference to the straight pack wherever practicable. In packing

this style the apples can be pressed into place firmly instead of having to jam them, so to speak, as in the square pack. Two of the advantages gained by using this pack are (1) it accommodates sizes that are not adaptable to the straight or square pack, and (2) there is much less danger of bruising the apples. There are four different kinds of diagonal packs, known as the one-two pack, two-two pack, three-two pack, and three-four pack. All are diagonal, the only difference being in the size of the fruit. Another pack, known as the offset pack, is very similar to the diagonal—in fact, may be considered the diagonal with the rows running lengthwise. It is not quite so uniform and



Two-two.

Three-two.

Three-four.

Offset.

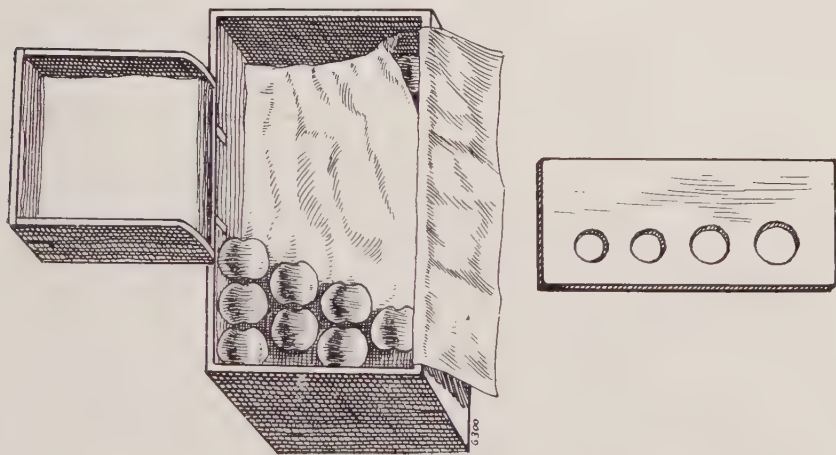
DIAGONAL PACKS.

attractive as the diagonal, as the vacant spaces at the sides are rather large and numerous. One of the many good points about packing apples on these styles is that the exact number of apples contained is always known, and, if stamped on the box, as it should be, gives information much appreciated by the buyer.

METHOD OF PACKING.

The first item in a perfect pack is a clean box. This necessity is overlooked only too often by some growers. After the box is secured and placed in position close to the packing-table, put in the lining-paper, allowing enough to cover over the apples when packed, and to present a better appearance when opened. If the wrapping-paper is in position all is ready for the first layer of apples. As stated before, packers usually wear a rubber finger-stall to assist in picking up the paper easily. Practice enables them to wrap the fruit rapidly. An apple is picked up in one hand, while the other reaches for a paper, and the two are slapped together as it were, and with a single twist

of the wrist the loose edges are gathered into a little bunch under the apple, and at the same time placed in position in the box. It takes very little longer to wrap the fruit than to place it in the box unwrapped, so quick is the continuous motion of wrapping and depositing in the box. The manner of putting up the square pack is too obvious to need extended description, although the judgment to know whether the apples on the table will go best into this or one of the diagonal packs must be gained by experience. In the diagonal pack it is most necessary to get the bottom layer absolutely correct and tight, then the other layers will be easy. If not, the bottom layer is apt to shift or slip in transit, and the whole pack will be broken, causing bruising. Opinions differ amongst packers as to the



METHOD OF PACKING.

way the apple should lie in the box, whether on the head, stem, or cheek. As a general rule I think the cheek packing is preferable, although some varieties of apples pack better one way than others, and therefore it is for the packers to decide which way to pack them to produce the best results. Two essentials of a perfect pack are honesty and uniformity—that is, the apples in the middle and bottom of the box should be just as good as those on top, and all of them as perfect as possible.

LABELS.

Attractive labels on the ends of boxes add much to the appearance and are a valuable means of advertising and building up a trade. These are not used in New Zealand as yet, but most other fruitgrowing countries never allow a box for export outside the packing-house

without a label. They are very cheap bought in large quantities, and there is space on the label for the variety of apple, the number in the box, and the grower's name.

EFFECT OF GOOD PACKING ON MARKET VALUE.

The question is often asked whether it pays to take so much trouble in packing fruit. One has only to ask any expert fruitgrower or buyer for a very definite answer. It will be found that the better the pack, the more easily the fruit is sold, and the better the price obtained. The first thing an experienced buyer looks at is the pack, knowing full well that only first-grade fruit is taken so much care of, that the apples will be in a much better condition as regards bruising, and that he, in his turn, will be able to sell better, and therefore will be willing to give a better price. The old-established motto amongst the principal apple-growers of the world is "The better the pack the better the price."

WEST CANADIAN APPLE OUTPUT.

WRITING from Vancouver under date of 1st November, the New Zealand Trade Commissioner reports that in British Columbia the apple crop has been very small—about 25 per cent. of the usual quantity. The quality has been somewhat better than usual, so the local growers have obtained better prices. The American apples, however, are very plentiful, and are being sold on this side for a very low price. Last season's speculators lost considerable money in the spring. The high-priced apples purchased last year were not so keenly sought after as was anticipated, with the result that there was a general scramble to dispose of stock before the new apples arrived.



THE NEW ZEALAND DAIRY ASSOCIATION'S NGARUAWAHIA FACTORY IN THE WAIKATO. On the right the original factory, one of the first dairy-factory buildings in the Auckland Province.

THE RABBIT NUISANCE.

E. CLIFTON.

THE rabbit nuisance continues. On country where it is simply dealt with as a nuisance effective control is maintained. This comparatively satisfactory position does not apply where trapping for export is in favour. This business has assumed large proportions: the rabbit is preserved. Some landowners demand a royalty or charge from trappers for the privilege of exploiting their country. It is assured that so long as the rabbit is permitted to be considered marketable for export its number will not be effectively diminished. This system of trapping for export extends over a large area of country. The interests in trapping occupy the attention of many people. The trapper, the landowner, the storekeeper (who usually is the financier of the trapper), the carriers (who collect from the trapper and transport the rabbits to the railways), the merchant (who supplies the storekeeper), the freezing-works, and the shipping companies are all concerned. These interests are incompatible with effective control of the pest. There are many representations made that this industry—for such it is—should not obtain the support and sympathy of the farmer. It is probably unavailing to represent that the crucial point is, Which is the more remunerative to the community, the live-stock of the farm and the crops, or the exploitation of the rabbit as an article of export? There cannot be stock and crops of the farm as well as the rabbit, and both be profitable. The one lives at the cost of the other.

An examination of the districts where trapping is a business is more than sufficient evidence that the rabbit thrives at the expense of the farmer. The *Otago Witness* has set out the position with force and succinctness. The publication of the article "Rabbit Plague" is opportune. It may be permissible to quote a part. It should be read and carefully considered by farmers throughout the Dominion. After describing some of the conditions surrounding trapping for export, the writer says,—

"On a property of 4,000 acres known to the writer, during the last ten years not less than 50,000 rabbits have been trapped, or an average of 5,000 a year. The property mentioned has changed hands several times, and the same system has been adopted in turn by each owner, and there is every indication that the rabbits are as thick as ever, and

no permanent diminution has been effected. As it is, the 5,000 rabbits caught annually would easily eat and destroy as much as 1,000 sheep. From the point of view of the Dominion, the question arises whether it is better to farm 5,000 rabbits or 1,000 ewes. That is the point which calls for decision. The return from the rabbits, calculated at 6d. per head, comes to £125, and from the ewes, with their lambs and wool, at about 15s. per head, equal to £750. There can be no question as to which is the more profitable to carry. The average annual export of carcasses for ten years prior to 1908 amounted to 4,200,000 carcasses, which, at 6d. each, represents a value of £105,000 per annum. That number would replace 840,000 sheep, from which an annual income of £630,000 might be expected. But that is not all. The annual export of rabbit-skins for the period mentioned is over six millions per annum. Taking both together, it means that the country as a whole is losing an income of close on one and a half millions sterling by failing to get rid of the rabbits. The natural inference is that any system which will tend to get rid of rabbits permanently should be compulsory, in spite of the dislocation of labour that might ensue. Rabbit-trappers are making incomes of £200 to £300 per annum at the expense of the country's exports. It may also be said that flock-owners have the matter in their own hands, and that by abandoning the system and poisoning twice a year they could easily and permanently reduce the number of rabbits. That would be perfectly correct so far as one of them is concerned; but his neighbours are not compelled to do the same, and the rabbits would close in on his fresh grass worse than ever. There is no solution of the rabbit nuisance short of stopping all trapping, and poisoning twice a year. Until that course is compulsory this plague and drag on the country's resources will not diminish, but rather tend to increase."

This concisely expresses the mind of all who have the best interests of the farmers of the Dominion at heart.

TO SUBSCRIBERS.

ANY subscriber who does not receive a receipt for a subscription forwarded for the *Journal* within a month should communicate with the Editor. There are now in the hands of the Accountant of the Department sixteen 2/6 postal notes, the origin of which cannot be traced, the senders having failed to forward their names. The subscription from the Masterton district (in the form of a postal note) unaccompanied by the subscriber's name is still awaiting the sender's identification.

PEA VARIETY TRIALS.

G. DE S. BAYLIS.

Every year a considerable number of bushels of peas, grown in New Zealand from seed specially sent out from England, are shipped back to the Old Country for seed, for boiling, and for other purposes. Hitherto the bulk of the peas were grown in certain portions of the South Island, and some doubt was expressed as to the possibility of growing peas of quality in the North Island owing to the influence of climate upon the development and colour of the pea. The best values are obtained for samples which are true to the type of variety grown, well filled, of good colour according to whether they be blue, white, ivory, or brown. Good harvesting and careful threshing are also necessary.

One great want in the system of cropping commonly carried on in New Zealand is the lack of leguminous crops in the rotation. Peas mixed with oats or maize, &c., form an excellent forage, and the growing of such mixtures, if suitably manured, so as not to exhaust the soil unnecessarily, would both feed the stock and the soil at the same time.

Peas grown for seed purposes only, when attention is given to the quality and colour of the type grown, should be a remunerative crop; and where the land has been carefully farmed the beneficial influence of the pea crop will be noted in the appearance of the roots, wheat, or other crops which follow it.

A few trials were arranged in one or two districts in the North Island, and the results will be found on the following page.

AN EXPERT REPORT.

As it was desirable to get an expert to report upon these North-Island-grown samples, some of them were sent to a large South Island buyer, who reported as follows (the index refers to the grower in the tabulated return):—

(3.) White Ivory peas: Colour excellent, quality first-class, value to-day (May, 1910), 5s. per bushel f.o.b.s.e. main port.

(1.) Early Minter peas: Colour good, quality fair; would like to see these filled out a little more. Dressing of this line is not too good; it contains too many straws, and looks as if it had been hand-threshed. Machine-dressing would extract the straws. Value, 3s. 6d. per bushel, f.o.b.s.e.

Experimenter.	Variety.	Soil.	Manure.	Seed.	Yield in Bushels.
Mrs. De Lisle, Masterton. Area, $\frac{1}{2}$ acre (1.)	Early Minter ..	Loam ploughed out of the turf	Blood 20 lb., super. 40 lb., boneflour, 30 lb., sulph. pot. 10 lb., seed gypsum 28 lb., $1\frac{1}{2}$ cwt. mixture per acre; cost, 9s. per acre	3 bushels per acre. Sown September 28th, in drills 7 in.	50
Chamberlain and Son, Masterton. Area, $\frac{1}{2}$ acre (2.)	Early Minter ..	Dark loamy soil, depth 2 in. to 6 in. on gravel subsoil, ploughed out of grass	Mixture of super. bonemeal, sulphate of potash, and gypsum	3 bushels per acre. Sown September 16th	13
H. Evans, Masterton. Area, $\frac{1}{2}$ acre (3.)	White Ivory ..	River-deposit 6 ft. deep, inclined to be sandy and stony in places; previous crop, oats,	Plot 1: Super. 28 lb., sulph. pot. 14 lb. per $\frac{1}{4}$ acre; cost, 12s. per acre. Plot 2: Super. 28 lb., agric. lime 14 lb., sulph. pot. 10 lb. per $\frac{1}{4}$ acre; cost, 10s. 2d. per acre	$1\frac{1}{2}$ bushels per acre. Sown September 23rd, in drills 21 in.	Plot 1: 41 Plot 2: 45
W. Miller, Ferridge, Masterton. Area, $\frac{1}{2}$ acre (4.)	Blue Prussian ..	Loam upon clay subsoil; previous crop, rape	Mixture of super. bonemeal, sulphate of potash, and gypsum	3 bushels per acre. Sown October 1st, in 7 in. drills	52
R. J. Dagg, Masterton (5.)		(Report not received, and consequently excluded.)			
W. A. Boucher, Kumeu (6.)*	Blue Imperial ..	Gum land (dry swamp); ploughed out of tea-tree	Ground limestone, 1 ton per acre (say £1); 300 lb. per acre of a mixture of slag, Christmas Island guano, bonemeal, nitrate of potash, blood; cost £1 6d. per acre	2 bushels per acre	..

* Considering the fact that these were grown on gum land newly broken from tea-tree, the crop and the sample were very satisfactory.

(4.) Partridge peas : Splendidly grown, but off colour. Looks as if these had been slightly weathered in harvesting, or else stook-threshed, which is not desirable in peas for export trade for which a good bright sample is required. Value, 3s. 8d. per bushel, f.o.b.s.e. main port. Had these been a better colour they would be worth more.

Blue Prussian (same grower) : Quality very good. Sample contains a few white peas that are not desirable. For export trade it is necessary to cut blue peas slightly on the green side, so as to give them as blue a colour as possible, as they are required for boiling purposes. If New Zealand could produce blue peas of a good colour free from white peas a very large export trade could be established with England. Value of sample sent, 6s. per bushel, f.o.b.s.e.

White Ivory (same grower) : Quite an excellent sample—in fact, equal to any that we have ever seen produced in New Zealand. We think they are equal to the very best produced in Blenheim. The value of these is 5s. 3d. per bushel.

CONCLUSIONS.

I consider these initial trials suffice to prove that at least certain districts in the North Island can produce peas equal to any which are grown in the South. In the North the threshing-machines are not provided with the special pea attachment which is found in the South, and consequently a large proportion of the peas are split, and the sample spoilt. As a forage-crop alone the pea is a useful crop to the farmer. As a soil-renovator, it, like other legumes, supplies to the soil that which no artificial manure can supply. Specially grown for the export trade, provided that the supplies do not exceed the demand (which at the present time does not appear probable), the grower should find the pea crop one which will place a considerable profit at his bank.



THE RIVERDALE DAIRY COMPANY'S FACTORY. TARANAKI, ONE OF THE LARGEST CHEESE-MAKING CONCERNS IN THE WORLD.

FROZEN MEAT.

A PLEA FOR ITS IMPORTATION INTO FRANCE.

THE following is an excerpt from a speech made by the Mayor of Roubaix, France, in support of a removal of the restrictions against the importation of frozen meat into France—a speech which was no doubt induced by the effective display of New Zealand frozen meat made by the Government at the Roubaix Exposition :—

“There exists in the Customs laws of France a summary clause regulating the introduction of meat, which prohibits its transportation from occupying a period exceeding a few days. This clause provides that each carcase shall contain its lungs and entrails, so that the Veterinary Inspectors may exercise a control over the entry into France. The gates of France are thus altogether closed against the introduction of those meats killed either in the Argentine Republic, New Zealand, Austria-Hungary, Russia, or any other European country.

“We cannot disguise the fact that the working-classes wish to provide themselves with wholesome meat at a normal price, and we are exceedingly surprised to be deprived of a source of provision which, thanks to the advance of science and the exceptional guarantees given by the sanitary requirements of the Argentine Republic and New Zealand, gladden the hearts of the English housewives, *without doing injury to the English farmers and breeders*, since the increase in the consumption of fresh meat in that country has not ceased to grow.

“The overseas countries offer to Europe unrivalled flocks, which are still capable of large development. Why should England alone have the benefit of this paradise of meat? I do not ask for a reduction of the Customs duties. I ask you not to argue on the clauses, professedly hygienic, but in reality prohibitive, to deprive France of the liberty of supplying herself with provisions. I ask the Conseil General du Nord to repeal the articles which enforce the retention of the viscera and lungs, and to apply the same rules as those which regulate the supply of the English markets, where during the last ten years fifty millions of oversea carcasses have been consumed, without injury to the health of the consumers.”



A NEW ZEALAND MEAT EXPORT COMPANY'S WORKS, THOSE OF THE GEAR MEAT COMPANY, AT PETONE, WELLINGTON.

BRITISH PORK MARKET.

In October last the Department obtained cabled information from the High Commissioner for the Dominion in London on the state of the British pork market. The cable read :—

In reply to your telegram of the 16th instant, frozen pork prospects are rather less encouraging than last year, as home supplies will be large and Chinese and Siberian supplies are likely to increase.

The High Commissioner has now reported by letter in extension of the above cable. He says :—

Last year the supply of pigs from all sources was less than usual, and consequently prices were high for both porkers and bacon pigs. Bacon, which is imported into this country in a "green" state, ready for "smoking," also rose greatly in price, the supply being insufficient for the ordinary demand. The high prices then obtained resulted in more attention being given in this country to pig-rearing, which, of course, is an industry capable of rapid development. Pigs in Great Britain and Ireland this year show a considerable increase in numbers. The carcasses of pork received from China last year also met with a satisfactory reception, and the prices then realized were such as to encourage continued export from that country, which is expected this season to increase its shipments. Siberia, likewise, with the development of dairying, and encouraged, doubtless, by recent high prices, is also increasing her export of pork.

For some weeks the Home bacon market has shown signs of weakness, and prices have been steadily declining. It is expected by those in the bacon trade that values this year will be more reasonable than those of 1910. This naturally affects the pork market, which has been weak in sympathy. For forward shipment I understand that buyers are not inclined to enter into contracts at more than 4½d. per lb. for fair average 90 lb. pigs. Good Dutch pigs are at present in considerable supply, and are selling on Smithfield market at 4½d. per lb.

Shipments from Australia have also increased this season. The current quotation for New Zealand carcasses of pork on Smithfield is 5d. per lb. The quality is acknowledged to be good, and it is possible that a premium over the price paid for good Dutch pigs ought to be obtained for them. Still, there is no doubt but that the figure received for shipments from the Dominion must be ruled by that paid for other qualities.

[According to the "Meat Trades Journal" of 23rd November, 1911, the decrease in the imports of fresh pork into Britain for the ten months ending 31st October (355,536 cwt., against 366,386 cwt. in the corresponding period of 1910) was due to the interruption of the Chinese trade, and, remarked that journal, "having regard to the terrible upheaval now going on in that country, it is impossible to say when it may be resumed."—Ed.]



BALED STRAW USED FOR A PIG-SHELTER ON A SOUTH AUSTRALIAN FARM.

A SIMPLE GATE-FASTENER.

A SIMPLE and effective method of fastening a wooden gate may be seen at the Waerenga Experimental Farm. It is here illustrated, both before and after fastening, and the pictures convey a clear idea of the arrangement. It is well to make the back wire suspender a little shorter than the one in front, as this increases the force with which the fastener enters the slot, and makes it more certain that the fastener will remain in the desired position. In making the device be sure to place the fastener well home in the slot in the post before boring the holes for the wire. Do not allow the fastener to have too much play in the gate. If the fastener is placed near the top of the gate it will be found easy to manipulate from horseback.



THE GATE.

The main picture shows the method of opening it, and the inset picture the position of the fastener closed, but outside the post instead of in the slot.

L I N S E E D.

T H E B R I T I S H M A R K E T.

THE following report on the prospects of the linseed market of Britain has been furnished by the High Commissioner :—

For some years the prices of linseed in this country have been high. Failure of crops in different producing countries during that time is ascribed as the reason for the advance in values. Especially in North America has the shortage been felt. Instead of having ample supplies, sufficient for its own requirements and for export to Europe, as formerly, large purchases have had to be made by that country, both here and on the Continent. This year, however, the North American crop is reported to be better, and likely to be sufficient for the country's requirements without further importations.

The countries from which the principal supplies of linseed are received are India, La Plata, and Russia, the quality received from the former country being esteemed the most valuable. Small quantities are also received from Morocco. The quantity received into the United Kingdom from all sources from the 1st January to the 31st August amounted to 918,335 quarters. This was considerably less than for the same periods in 1910 and 1909, when the figures were 1,097,613 and 1,273,751 respectively. Stocks held both here and on the Continent are at the present moment extremely low, and it is not anticipated on the market that there will be much increase for some time to come; consequently the market is very firm, and likely to remain so. Some years ago parcels of New Zealand linseed were handled in London, and the quality of these shipments was favourably reported upon. There is a good market for quality such as then sent from the Dominion. Of course, without a sample being submitted, it is difficult to give a value, but I am informed by those handling linseed that for New Zealand seed similar in quality to that formerly handled about 72s. per 416 lb. ex store London would be a fair quotation. It must not be forgotten, however, by intending shippers that the market for linseed fluctuates very considerably, and consequently is rather speculative.

In giving quotations for linseed considerable difficulty might be experienced, as, owing to the various weights going to the quarter in different countries, misunderstandings might arise. Thus, 410 lb. go to the quarter in the case of Calcutta linseed, 416 lb. in that of Bombay and La Plata, and 424 lb. for Russia. Calcutta seed is worth at present on average 73s., Bombay 74s., La Plata 69s., and Russian 70s. The reason for the price of La Plata seed being lower than Indian is that the quality of the oil produced therefrom is not as fine.

Linseed is chiefly used in this country for the purpose of oil-extraction, the oil being largely used in the manufacture of paint and linoleum. The residue is used in the preparation of cake for cattle-feeding, &c.

It might also be mentioned as of interest to New Zealand producers that the market in this country for rape-seed is good, and likely to continue so. Prices have advanced steadily during the past five or six years, and are now over 50s. per 416 lb., at about which figure the demand has been strong for some considerable time.

THE HEMP INDUSTRY.

W. H. FERRIS.

WEATHER AND QUALITY.

THE unseasonable weather has had a marked effect on hemp quality during the past month. The colour has suffered seriously. The prevalence of strong winds disturbed much of the fibre in the drying-field, and where it escaped injury from this cause the weather was too rough to permit the fibre being turned. The result was that much of the fibre had to be baled before it was properly bleached, and in consequence fibre which would otherwise have reached a "good-fair" grade had to be classed as "fair."

A WEAK POLICY.

It is noticeable that some millers who are under contract to supply a "fair" grade hemp exhibit an unnecessary carelessness, stripping too rough a fibre, which means that only a rough low-pointed "fair" hemp is secured. Where the stripping has been decently done it is only necessary, if a "good-fair" parcel is desired at any time, to search thoroughly well to obtain the desired result.

THE LABEL QUESTION.

It is gratifying to know that the labels on export bales, about which so much complaint has been made, are showing a decided improvement in style. There are still, however, several cases where millers are failing to conform to the regulations.

DISEASED LEAF.

While the Wairarapa phormium was singularly healthy last year, diseased leaf is very common in the swamps of the district this season. This is having a serious effect on fibre quality.

COLOUR.

Where improved mechanical means of catching and washing have not been adopted the colour of the fibre is very unsatisfactory, and too often is effectively preventing the fibre reaching a high grade. Unless the most up-to-date appliances are adopted careful work is largely discounted.

Even, however, where the most modern methods are employed the benefit of these is not always being realized owing to careless work in stripping. The benefit of improved machinery is only noticeable where the workmanship is maintained at a high standard.

PROSPECTS.

The outlook for millers is much better, but Manila hemp is still in large supply, while the demand for binder-twine is not as good as it was anticipated it would be. Tow is, however, in strong demand everywhere. Under the circumstances, it is gratifying to know that the tow being shipped is of an all-round good description, very little third grade coming to hand.

MACHINERY FOR STRIPPING ABACA.

At the recent Fibre Congress in Java several abaca (Manila hemp) stripping-machines, made in France and England, also one from the Philippines and one from the United States, were shown and tested. Most of the trials in stripping abaca by machinery indicated, says the *Cordage Trade Journal*, that further improvements are desired, either in the capacity of the machines or in the efficiency, as shown by the waste or by the quality of the fibre.

THE FROZEN-MEAT TRADE IN THE ARGENTINE.

ONE owes to Dr. Pedro Bergès, professor at the University of Buenos Aires, remarkable endeavours with a view to developing in the Argentine the employment of, and information concerning, the freezing industry. An active propaganda started in 1907, in the interest of the first International Freezing Congress held in Paris, brought to the organizers of the Congress the enrolment of 1,200 Argentine members. In a similar manner, at the second International Freezing Congress, held in Vienna in 1910, Professor Bergès was able to enrol 1,230 of his countrymen. Let us add that the International Freezing Association includes 1,200 members of the Argentine Republic, whole enrolment is the work of Professor Bergès, and that the Argentine Committee has become the benefactor of the said association. The International Freezing Conference is due to the initiative of our Buenos Aires colleague. The Argentine Republic can affirm, not without reason, that inspection of meats is carried out nowadays in its abattoirs and export freezing-works with method and exactness. In 1890 the Argentine exported 663 tons of frozen beef and 20,144 of mutton; in 1909 the exportation reached 209,435 tons of frozen meat, 1,222 tons of chilled beef, and 66,495 tons of frozen mutton. The capital invested in the eight large freezing establishments of the province of Buenos Aires exceeds 150,000,000 francs (£6,000,000).—*L'Hygiène de la Viande et du Lait*.

THE APIARY.

NOTES FOR FEBRUARY.

F. A. JACOBSEN.

THE spring and early summer of 1911 has been the worst experienced for a number of years from a beekeeper's point of view. The dryness in the early part of the season had a tendency to destroy the young clover-plants, and beekeepers were getting dubious about the honey crop when unexpectedly rain and stormy winds became unusually frequent. The rain has had the effect of reinstating the clover and giving the plants good roots, while the winds have kept the bees from going far from their hives for forage. This has prevented brood-rearing proceeding satisfactorily, resulting in a great number of colonies being weaker than they should have been under average conditions. Should the weather take a turn for the better a good season will probably be experienced, and the weak colonies will build up to a good strength rapidly. As a general rule clover commences to bloom about the middle of October, but in the absence of hot weather, with the temperature at about 70° or over, very little nectar is secreted. The season of 1907 in Canterbury was somewhat similar to the present one, only then the rain came after Christmas following a dry spell, and had the effect of freshening up the clover sufficiently for beekeepers to secure a second honey crop.

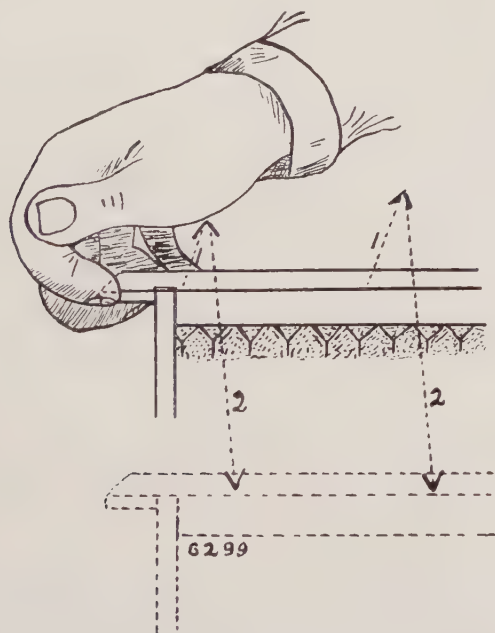
These notes are written a month in advance, and are intended for general application, therefore allowance must be made for local and weather conditions.

EXTRACTING.

Apiarists in normal seasons commence extracting about the middle of December, but at the time these notes were written there was ample indication of the commencement being delayed until a month later, or the middle of January. Operations should start when the colony has one super with about three parts of its combs capped, and, if supering has been done properly, one will still be left for the bees to keep working on. Some beekeepers have a super filled with nine combs already extracted, and tier this in the place of the full one taken away. Either plan may be adopted successfully.

In the course of manipulating the colony it is often necessary to remove one or more supers, and, instead of placing them directly on the

ground, a convenient temporary stand can be arranged by using an ordinary empty body or by placing the top on the ground upside down. I think the body is the better plan, as it saves an undue amount of lifting when placing the supers in position again on the colony. A barrow is usually wheeled from hive to hive, and is either fitted up in box fashion the correct size and depth for holding frames, or it has a flat bottom with no sides, on which may be placed an empty super. As the full combs are taken off the colony and the bees dislodged, they are placed one by one in the receptacle on the barrow. If many robber bees are about a hinged lid fitted to this receptacle will be found very convenient for keeping them off.



CORRECT METHOD OF SHAKING FRAMES.

SHAKING FRAMES.

The illustration herewith describes the best method of dislodging the bees from combs; it saves a great amount of brushing, and 90 per cent. of the adhering bees can be shaken off in a twinkling. After the frame has been drawn from the hive hold it suspended by the middle fingers at each end, and with an upward jerk (the ends of the frame are struck against the ball of the thumb), followed quickly by a downward thrust of the hand on the top bar of the frame, the bees are dislodged. The shock forces the bees upward into the air, a direction in which they least expect to go. After this a few rubs with the brush over the cells will

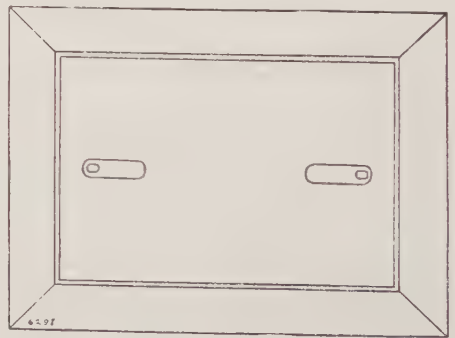
sweep off every bee, or if a few bees are not objected to the brush may be dispensed with altogether.

UNCAPPING.

Presuming you have got a supply of full supers in the honey-house and everything ready to commence extracting, one of the chief things to look to is the honey or uncapping knife. After long use of various kinds I think the "Bingham" with its broad stiff blade is superior to any I have ever tried. The "Novice" knife finds favour with a few, while more prefer an ordinary carving-blade, but the "Bingham" has a large majority of supporters. Two knives are used alternately, and while one is being used the other is kept in almost boiling water, and *vice versa*. Lean the frame over towards the knife so that whatever you cut off falls clear of the uncapped portion of the comb underneath, and in this way leaves a clean smooth surface. An arrangement that is indispensable in connection with an apiary run for extracted honey is a good strong wax-press. One which answers the purpose splendidly may be made out of a cheese-press. Each night after all the uncapping is finished the cappings may be put into this press and every particle of honey squeezed out. The cappings are pressed into a solid block of wax, and the honey obtained is of the original quality and has not been spoiled by heat being applied or in any other way. I will explain this press more fully in a future issue of the *Journal*.

BEE-ESCAPES.

A very simple method of ridding the supers of bees while still on the hive will be found in the use of the bee-escape, as illustrated. This is a board of the exact size to cover the top of a super completely, and into this board is fitted one or more Porter bee-escapes. The whole thing is placed underneath the super you want the bees to evacuate, and if this is done in the evening and left overnight it is certain, unless brood be there, that very few bees will be left in the super in the morning. These escape-boards are particularly handy to comb-honey producers, but for extracted-honey men they can only



THE BEE ESCAPE.

be used to advantage on very warm nights, on account of the honey getting too cold to extract easily the next day. A few should always be kept on hand.

HONEY.

Always allow your honey to stand in the tanks to settle for at least three or four days. A lot of froth and minute particles of wax, &c., will rise to the top, where it can be skimmed off, and it is always best to tap off the bottom only, leaving about 6 in. of the top honey in the tank to be mixed with the next extracting. If this practice is kept up and you always keep a little honey in the tank, never drawing it quite dry, your sample of honey will be quite clear and free from all particles of foreign matter. In reference to putting the produce up in bulk for export or for New Zealand markets, a 56 lb. tin is recommended, and two tins to the case. This size of tin is especially favoured by the English market.

REMARKS.

In an interview with Mr. Southcott, who has just arrived from England, and who was for six years under the Devon County Council, being lecturer to the Devon Beekeepers' Association, he stated that our palish-yellow New Zealand honey was just what the English market required. Honey sent Home, he said, must not be too white or too dark, but be of a nice mild yellow colour and of good body and flavour. He thinks the establishment of a depot at Home a first-class idea, and does not hesitate to say that our prices as at present ruling could be materially advanced under that system and cooperation combined.

This is decidedly encouraging, and I hope that in the near future beekeepers of the Dominion will realize what a lot there is yet to be done, and do it.



THE FEED-ROOM (IN THE FOREGROUND) AND THE INCUBATOR BUILDING IN THE POULTRY SECTION AT THE RUAKURA FARM OF INSTRUCTION.

The wind-gauge and meteorological apparatus are shown in the centre of the picture.

ORCHARD WORK FOR FEBRUARY.

W. A. BOUCHER.

CULTIVATION.

IN many localities in the Dominion the weather conditions prevailing during the month of February are usually warm and dry. In order that the necessary moisture for the full development of fruit crops may be retained in the soil, thorough working of the surface should be continued. That the reason for this may be fully understood, it may be explained that when the surface soil remains undisturbed the particles of soil lie so tightly together that capillary action results. Thus, during dry weather the moisture from the subsoil travels continuously to the surface, and, being evaporated by the sun-heat or carried away by drying winds, both surface and subsoil become parched, and fruit crops suffer in consequence.

The simplest and most effective way to prevent this is to keep the surface soil well worked, by cultivator or other suitable implement, thus forming a mulch in which the earth-particles are well separated. Capillary attraction between surface and subsoil being checked, the moisture is retained in the subsoil, to be utilized by the trees for their own development and that of the crops they are carrying.

The above remarks apply with almost as much force to orchards of young trees that have not yet commenced to bear as to those that are bearing, for sufficient moisture is necessary for the development of the young trees, and, if deprived of this, stagnation of growth takes place, as well as stunting, from which in many instances trees do not readily recover.

Methods of mulching other than the earth mulch have sometimes been advocated and employed, but can hardly be recommended. For instance, a layer of straw or other similar material spread round about the trees is only partially effective in the retention of moisture in the soil, while it has the disadvantage of harbouring insect and other orchard pests.

CODLIN-MOTH.

Although by the month of February the season will be well advanced in many districts, efforts to prevent infection by codlin-moth must not be relaxed. It has been by no means unusual that the moth has appeared in large numbers about the middle of the month, and if precaution has not

previously been taken to prevent infection a percentage of loss to a varying degree has followed. Much, of course, depends on the climatic conditions of the season and district, but growers of pip fruits are advised to spray with the arsenate of lead during the early part of the month on the lines suggested in previous issues of this *Journal*.

With such a remedy as arsenate of lead—one that is so easily prepared, effective, and economical—no effort can be too great, especially on the part of domestic growers, to bring this pest under control, even if it does involve the spraying of crops as late as February, a period when many seem to think the work of the earlier part of the season should suffice.

BITTER-ROT OF THE APPLE (*Glomerella rufo-maculans*).

The season before last considerable trouble and loss was experienced, especially in some of the northern districts, by bitter-rot. Some varieties of apples proved to be particularly susceptible to attack, the percentage of loss being exceptionally heavy. This disease, due to attack by fungus, can be distinguished by the appearance in the skin of the fruit of a dark, sometimes almost black, spot of varying size accompanied by a slight depression. It will hardly be possible to confuse it with apple-scab, or "black spot," as it is sometimes called, for this fungus causes a roughness of the skin, while in the case of bitter-rot the skin remains smooth. Moreover, apple-scab makes its appearance early in the season, while bitter-rot will hardly be noticed until the fruit has commenced to ripen. There is no doubt that the outbreak of this disease during the season referred to above was in a large measure due to exceptional climatic conditions; but it would be as well for growers to keep a good lookout for the first appearance, and then if necessary spray with the 4-5-50 Bordeaux mixture, adding the arsenate of lead in districts where codlin-moth is prevalent.

LEECH.

Attention may again be called to the remarks on this pest made in the last issue of this *Journal*, especially with regard to the detrimental effect that an unrepressed attack will have upon young trees, which, because they have not yet commenced to bear, have not received the treatment usually afforded to the bearing trees.

BLACK SPOT AND MILDEW OF THE GRAPE.

Black spot will by this time have ceased to cause anxiety to vine-growers; but a careful watch should still be kept for mildew. Should this fungus be noticed attacking the vines even slightly, precautions as indicated in the January number of this *Journal* should at once be taken to prevent the disease from increasing and spreading.

TOMATOES.

With regard to the cultivation of tomatoes, especially under glass, it is noticeable that unsatisfactory results are frequently brought about by manuring either too early or else too heavily, and in some instances by both combined. Growers will have noticed that tomato-plants are gross feeders. If manure is applied in excessive quantities, or too early, rank growth follows, the foliage produced being more liable to attack by disease, while fruit-production, especially upon the lower portions of the plants, is decreased. Growers are advised to manure with strict moderation. Better results will also be derived by giving the soil a light top dressing from time to time, after the crop has commenced to set, than by applying a full quantity before that period.

With a view of increasing the facilities for controlling tomato-diseases the soil and interior of the house should be kept as sweet and clean as possible. A decaying straw or manure mulch may be expected to increase the difficulty in keeping fungus diseases under control, as well as having a tendency to harbour insect pests. The best mulch for the retention of moisture that can be provided is that produced by the frequent working of a well-pulverized surface soil.



A NELSON VINERY.

COOL STORAGE OF FRUIT.

W. A. BOUCHER.

TEMPERATURE.

IN the initial stages of cool storage under such conditions as at present prevail in New Zealand the question of temperature is one that necessarily presents some difficulty. In countries where large surpluses of fruits of different kinds are available, cool storage has developed to such an extent that chambers are maintained at different temperatures to meet varying requirements. No doubt in time, with the continuation of the present rapid development in the planting of orchard land, the fruit industry will demand the facilities for cool storage already in existence in other countries. At present the surplus of fruit available in New Zealand for cool storage is limited, so that it is hardly possible that at any one place several chambers could be maintained at the average temperatures required by fruits gathered at different stages of ripeness or required to be stored for varying periods to meet the requirements of special market conditions. Moreover, without increasing the cost of storage it is hardly possible to regularly maintain the temperature to an almost unvarying degree.

In the meantime it may be stated that it is agreed by the best authorities and already proved in the Dominion that about 33° Fahr. is the best average temperature for the storage of hardy fruits gathered and stored for ordinary market purposes.

GATHERING.

Growers are realizing more and more every season that, for whatever market it is destined, fruit should be carefully handled both in picking and packing, so that when opened up for sale it will appear free from bruises. This is especially so if it is intended for cool storage, for in the case of some varieties the bruised appearance becomes intensified after a period in the cool chamber, thus rendering the fruit unsightly. In the case of other varieties decay from bruises rapidly sets in, and cases or whole lines become a partial or total loss. This has been abundantly proved in the experiments carried out by the Department. Comparisons have

been afforded between cases of the same varieties of both apples and pears gathered and handled under different conditions. It has been very noticeable that varieties of ordinary good keeping qualities if roughly handled and bruised before storage have failed to keep, while other cases of the same varieties carefully picked and packed have kept for four months in perfect condition. In the case of some varieties of pears it has been demonstrated that even when the fruit has remained quite sound exposure to the light after cool storage has caused the development of unsightly marks upon the skin, due to careless handling before packing. Growers throughout New Zealand are looking forward to an export trade in fresh fruit. In this connection they realize that special conditions of picking, packing, and handling, to which they have not been altogether accustomed are necessary if successful results are to be expected. Practically the same conditions that apply to successful export must be regarded as necessary if successful and profitable results are to be expected from cool storage.

VARIETIES.

During the season of 1909 a large number of varieties of apples and pears were placed in the cool chamber. The following kept well:—

Apples.

Allington Pippin.	Gladneys Red.	Pride of Australia.
Adam's Pearmain.	Gravenstein.	Rome Beauty.
Aromatic Russet.	Hame's Seedling.	Rokewood.
Boston Russet.	Herefordshire Pearmain.	Red Spy.
Ben Davis.	Jenkin's Seedling.	Rambo.
Ballarat Seedling.	Jonathan.	Robin Palmer.
Baxter's Pearmain.	Just's Improved Boston Russet.	Rhymer.
Brabant's Bellefleur.	John Toon.	Stewart's Seedling.
Cox's Orange Pippin.	Jones' Seedling.	Springdale.
Cobham.	Kentish Redstreak.	Sturmer Pippin.
Charles Ross.	Lane's Prince Albert.	Striped Reefing.
Claville de Riese.	Late Aromatic.	Shepherd's Perfection.
Cleopatra.	Lord Wolseley.	Stone Pippin.
Claygate Pearmain.	Munroe's Favourite.	Shiawassee Beauty.
Cornish Aromatic.	Main Black Twig.	Traveller.
Apple of Commerce.	Magg's Seedling.	Von Moltke.
Duke of Clarence.	Mank's Codlin.	Wallace Howard.
Delicious.	Maverock's Sweet.	Winter Strawberry Pippin.
Dougherty.	Merritt's Pearmain.	Washington.
Ethel.	Newton Pippin.	Wellington Pippin.
Emperor Alexander.	Norfolk Bearer.	Willie Sharp.
English Golden Russet.	Ortley.	Walridge.
Esopus Spitzenberg.	Prince of the Pippins.	Wolfe River.
Five Crown Pippin.	Pioneer.	Winter Majetin.
French Crab.		

Pears.

Beurre Grés d'Hiver.	Duchess D'Angouleme.	Shobden Court.
Beurre Clairgeau.	Gilgal.	Verulam.
Beurre Capiaumont.	Harrington's Victoria.	Vicar of Winkfield.
Beurre Bosc.	Josephine de Malines.	Williams' Bon Chrétien. (For
Beurre Alexander Lucas.	Keiffer's Hybrid.	cool storage this pear must
Beurre Superfin.	Le Comte.	be picked green and stored
Bergamot Reine.	L'Inconnue.	in the chamber as soon
Black Worcester.	Madame Cole.	as possible after being
Conference.	Nouvelle Merveille.	gathered.)
D'Joubert.	President Durard.	Winter Nelis.
Dorset.	P. Barry.	

More recently special attention has been paid to some of those varieties that are most favoured for the local markets and for export. The following kept well :—

Apples.

Sturmer.	American Winesap.	Jonathan.
Adam's Pearmain.	Munroe's Favourite.	Rome Beauty.
Stone Pippin.	Newton Pippin.	Delicious.
Cox's Orange Pippin.	Pride of Australia.	Scarlet Nonpareil.
Cleopatra.	Lord Wolseley.	Gem.
Epp's Seedling.	Scarlet Queen.	Nonpareil Russet.
Norfolk Bearer.	Kenny's Winter.	

Pears.

Beurre Diel.	P. Barry.	Beurre Clairgeau.
Winter Cole.	Vicar of Winkfield.	Beurre Bosc.
Winter Nelis.	Beurre Bachelier.	L'Inconnue.
Passe Colmar.		

It will be noticed that later experiences confirmed the previous ones. The above-mentioned varieties were stored for periods ranging from three to four months.

PROFIT OR LOSS.

Naturally the consideration that most concerns the fruit-grower is whether his average returns for the season will be increased or decreased by catering for what he may consider a special market, or one that so far he has not been accustomed to. Possibly, though not probably, at first the net returns from the sale of fruit after cool storage may not greatly exceed the net returns of fruit sold direct from the orchard to the consumer, but as the output increases cool storage will, I feel sure, be recognized as a necessary means of regulating the markets during the flush of the season, preventing unprofitable fluctuation, and so maintaining an average return that will afford a satisfactory profit for the season's work.

It is very noticeable that for five months after our season has closed Tasmanian, Australian, and American growers feed our markets with profit to themselves. Surely our markets, with the assistance of cool storage for prolonging the season, should provide a profitable means of disposing of a surplus of our locally grown fruit.

THE FARM GARDEN.

W. H. TAYLOR.

THE value of celery in winter can scarcely be overestimated. Its uses are various—green tops for flavouring soups, &c., the blanched stems for stewing, or in a raw state as a salad. Well-grown heads only are satisfactory. Now is the latest date on which it will be of any use to plant. It is well known that celery never makes really good growth till the days begin to shorten and cooler conditions prevail; it is equally well known, however, that there must be some advance before that time, or the growing season will be past before a serviceable size has been reached. Celery is grown in trenches thrown out a spit deep, and some half-decayed manure dug in at the bottom. Plenty of water must be given till the plants are established, and as much after as can be managed. After the plants have attained considerable size liquid manure may be given with advantage. The easiest way is to give it in the form of some strong liquid, and immediately a copious watering with clear water. The quality of celery depends largely on the moulding up. There is some art in doing this properly. Care must be taken to prevent the stems from bulging in the middle. If the finishing soil at the top of the mound is jammed too tight around the stems, forming a point of resistance, the stems bulge like a badly folded umbrella, and two evils follow—viz., the soil gets into the heart, and the stems are rendered pithy or woolly. It is unwise to mould up little by little as the plants grow, though this was formerly the usual practice, and still is in some places, where as a rule the soil is trenched and manured to a depth of 3 ft. On shallower cultivations the plants are likely to starve if moulded early, owing to the almost impossibility of giving water to the roots. The initial step in moulding up should, however, be always taken early. As soon as the plants get well into growth the outer stems have a tendency to spread out horizontally, and lie flat on the bottom of the trench. This should be corrected by drawing in a little soil and pressing it round the plants, tightly enough to hold these stems, so that they point upwards. They will then continue to grow in that direction. If left late they cannot be brought up without breaking. Celery may be moulded up in batches. It takes at least four weeks to blanch after moulding up, as the plants grow much better before moulding up. Only what is estimated as sufficient should be moulded at first. The operation is best done by two persons. One holds the plants together

and directs the soil, which the other throws in. If there is but one operator it is best to tie the plants first with a strand of raffia. The soil should be packed very firmly around the plants at the bottom, leaving it rather loose at the top.

Planting broccoli should be completed by now. If it is not there should be no delay. They must have a long time for growth. If left much longer they are quite likely to remain in the ground over next season before buttoning. I have known them to occupy the ground from eighteen to twenty months. Cabbages should be got out at once, as well as Savoys. These should be all in by the end of January, for though they grow on and heart all winter, they will not do so unless they have made good headway while warm weather lasts.

So far, owing to wet and windy weather, insect pests have not been troublesome. Diamond-backed moth and aphis may, however, be looked for if dry weather sets in. Cabbages, and more particularly Brussels sprouts, are often affected by an aphis somewhat like American blight. When the number of plants to be treated is not large this pest is easily dealt with—is in fact, no menace at all. Boiling water applied with a garden syringe destroys it at once, and does no injury whatever to the plants. It will be recognized that boiling water applied in this manner is not boiling when it reaches the plant, therefore merely hot water will not answer the purpose; on the other hand, if poured on to the plants it would probably kill them. The so-called cabbage-fly is more difficult to deal with; indeed, unless means can be found to force growth—by irrigation or copious watering—it is useless to attempt it in a very dry season. If, however, there is a fair rainfall and plants keep growing there is some hope of success. I have found that the handiest method in such cases is to spray the centre of the plants with a strong solution of hellebore, not troubling about the outer leaves, but applying it frequently to the young leaves in the centre. The hellebore should be boiled for at least half an hour in a small quantity of water, then mixed with cold water in the proportion of 1 oz. per gallon. Arsenate of lead is effectual, but frequently burns the leaves. Ammoniacal liquor, from gasworks, is only within the reach of few. It is the best known preventive. The liquid should be mixed with sixteen times its bulk of water. The plants should be well soused, and the ground watered with it. The treatment should begin before the caterpillars are in evidence. The aroma being objectionable to the moth they go elsewhere to deposit their eggs. The liquid is also a powerful manure.

Sowing peas must now be discontinued except in the warmer parts of the Dominion. French beans may be sown generally till the first week in February. In most places a sowing about the middle of that month will give a light crop about Easter time, valuable because of its lateness.

Good strong cauliflower plants put out now will be in use during Easter. The soil must be well manured and the plants kept growing, for if they get any check, either by drought or insect enemies, they are sure to button prematurely and be worthless.

Turnips should still be sown in small area.

Sow now, as the latest date, silver-beet and spinach for winter. The beet will require thinning, to stand about 12 in. apart, and the spinach about 8 in. apart. The best variety of spinach is the round one, and though it is called "summer spinach," that appellation does not apply in this country except it may be in the colder parts.

VEGETABLE TRIALS.

Peas—To test their respective merits as first earlies the following varieties were sown side by side on the 8th July at the Weraroa Experimental Farm: American Wonder, English Wonder, Daybreak, and Carter's Springtide. All gave the first gathering of well-filled pods on the 17th November. American Wonder is the poorest of all by many degrees. It appears to be run out and will be discarded in future. Its growth is naturally shorter than the others, but it is not so prolific as it formerly was. It is impossible to discriminate between the others. The haulm of all averaged rather more than 30 in.; the pods are well filled, the number of peas in each pod varying from 4 to as many as 10, the average being about 6; the crop was prolific, and the flavour good for their class.

On the 15th August Carter's Springtide, Sherwood, and Sutton's Dwarf Defiance were sown. Carter's Springtide was first gathered on the 1st December, and Sherwood on the 8th December. At the time of writing, 14th December, Defiance is rapidly filling its pods, and will be ready in about a week. Sherwood is a superior pea, with large pods and peas, and will in future be sown with the first earlies, but not to supply the first gathering. Dwarf Defiance is one of the best main-crop peas now in cultivation, and was sown with Springtide and Sherwood to succeed those varieties in use, as it takes longer to grow.

Cabbages Cooper's Early Market and Drumhead were sown on the 10th April and planted out early in July. Cooper's Market is of the ordinary type of early cabbages, of which there are many with no difference in economic value. A few only of Drumhead was planted, the purpose being to test its value for anything than a winter sort. At the present time it shows no sign of hearting—is a failure, in fact. The others have been hearting well, and have been in use since the 11th November.

Cauliflowers—Early Erfurt was sown on the 10th April, and the first cut was obtained on the 9th December—nice clean solid heads of medium size. This variety and Early London are reliable sorts for early use.

THE POULTRY INDUSTRY.

F. C. BROWN.

COST OF PRODUCTION.

At the current prices of foodstuffs it is safe to assume that many thousands of birds in the Dominion are not paying for their keep or are not likely to show a net profit over the season. Especially is money being lost by feeding cockerels when these have reached from four to four and a half months old. To repeat, there is no money in rearing cockerels unless these are done well from the start and are marketed in prime condition at an early age. Birds that are of the drone type and which are now commencing to take their periodical rest should be marketed without delay. The longer they are on the plant the greater the drain on profits. February and March moulters can hardly be depended upon to lay till well on in winter, just when eggs are cheapening. Under the circumstances, will it pay to feed these birds for five or six months with wheat and pollard at the prices now ruling? Better to wring their necks, and thus have no drain on the profits of the pullets and the late moulters. It is not uncommon to find the late moult laying up till April and even May, and very often they commence laying again before the early moult. As for the second-year birds, they should be marketed immediately they have ceased laying. It will seldom or never pay to keep a bird for a third season, unless, of course, it is a noted layer and is required for the breeding-pen.

A CULLING NOTE.

In the work of culling the wise poultrykeeper will look to the moulting stage as a good sign by which the profitable birds may be distinguished from the unprofitable. In other words, they will discard the early moulters and keep the late moulters. In the management of the birds to be retained some discretion requires to be exhibited. The best of the late moulters which it may be desired to retain for the breeding-pens next season should be kept by themselves and be placed on a light nourishing diet, while the others should be fed a forcing ration in order to get all the eggs out of them. Obviously, the bird that has been forced to the limit, and has therefore had to undergo a heavy drain on its system, will not be in a fit condition to produce eggs with the strongest germ in the breeding period. I have seen birds in February and March, the pick of a big flock—the “old battlers,” with tails worn down and conveying even

to the inexperienced eye the impression that they had earned considerably more than their keep—which were at once put into breeding-pens for autumn hatching. The result was disastrous. The progeny were weak, undersized, and have not yet laid marketable eggs, while their output has not been equal to that of their dams; in fact, they have shown in every way absolute deterioration. Certainly they are the last birds an experienced man would select to breed from.

MATURITY.

A very common and mistaken idea, where egg-production is the objective, is that size is everything in the growing chick. It is declared that under certain systems of brooding and feeding chickens will make greater progress than under other systems. May be they do, if size alone is the object to be aimed at. The most successful men to-day will admit that the chick reared by the hen has the best start in life, as it matures naturally and has therefore greater opportunity of developing a sound and vigorous constitution. The artificially reared chicken may beat it at the time so far as size is concerned, but this is because it is a more forced product. There is here a distinct analogy between the plant reared under natural conditions in the open, making for hardness and power to resist disease, and the tender hothouse plant which only has the advantage of size due to the artificial forcing to which it has been subjected. The most important advance made in recent years in artificial brooding has been the elimination of forcing conditions as much as possible, removing the risk of the chick receiving too much warmth and giving it only sufficient heat to enable it to thrive, and while guarding against extremes of temperature, introducing the hardening-off process gradually but with as little delay as possible. Nature has provided bird-life with a means of protecting itself against cold temperatures, and nothing should be done to retard this process. The chicken reared by the hen may be smaller to the eye than that artificially reared, but it is more tightly feathered, firmer in the flesh, and generally more vigorous, whereas the artificial chick has not the quality of flesh and frame, is looser in the feathering, and is probably less able to withstand adverse conditions. This note is not written with the object of discrediting in any way artificial production, but rather to guard poultrymen against the weakness in rearing chickens under artificial conditions—the tendency to unduly force the stock to maturity. Even allowing, as a result, that artificially reared birds come to lay early, the ultimate advantage of this is doubtful. One weakness in egg-production to be guarded against is the small size of many eggs at the present time, and it is certainly not to the unduly forced bird that we must look for improvement in this respect. I have seen birds which the owners boasted had come to lay at three to four months old; but judging by the size of the eggs they were not altogether desirable stock to perpetuate. It is not the diminutive bird which wins in the egg-laying competition,

but the bird with some timber, that has the power to last out a long and heavy laying season ; and these birds as a rule lay a decent-sized egg. Not when a bird commences to lay but the number of eggs she will lay in the dear season, and under adverse conditions, the while her product is of a good saleable size, is the factor that determines her value. It is a mistake to make high records the sole objective ; the day is fast coming when the consuming public will object to paying full market rates for eggs that rattle in the egg-cup.

THE DUCK QUESTION.

There is a good prospect for the breeder who will develop good laying strains of the heavier type of duck, so that while the production of eggs will be satisfactory the carcase may prove a profitable marketable commodity. The Indian Runner is undoubtedly a fine layer, but its carcase is little favoured by the city poulterer, some of whom, in fact, refuse to handle them. I would like to see the New Zealand Utility Poultry Club extend its duck-laying competition by offering some encouragement to the heavier types, in the shape of special prizes for carcase and egg-power combined. The Buff Orpington is not as popular as it deserves to be. It provides a very nice carcase, and certain strains of the breed are excellent layers. Both the Aylesbury and the Pekin are splendid table birds, but there is decidedly room here for improvement of the egg-yielding power. Birds of these breeds lay well while they are at it, but unfortunately their laying season is very short. There is an interesting field here for the poultrymen who will study the breeding of these by selection, as the mating of long-season layers with a drake from a long-season duck would probably provide the foundation of a type which would materially advance the annual egg-yield of birds of these breeds. There is some talk of an export trade in poultry, and when local markets have been properly supplied this will have to be seriously considered. But it will be useless reckoning to make an export trade in ducks pay by shipping Indian Runners. In this connection the work of extending the laying period of the heavier breeds is seen to be imperative, as unless these are bred to lay later on in the year it will not be possible, except an undue number of breeding-pens are maintained, to secure sufficient eggs for hatching at the desirable time, the last four months of the year, the best months for supplying the Home markets being January to April.

AN EXPERIMENT.

In connection with its exhibit of the Dominion's products at the Festival of Empire in London, the Department made a display of dressed poultry, prepared by Mr. R. Pounsford, of Christchurch. The birds were afterwards valued by Messrs. Pratt and Cave, Poultry Salesmen, of Smithfield, and their expert opinion has just been received through the High Commissioner. It is in every way satisfactory. The Smithfield firm states that the birds were a good quality, were well dressed and graded, and the packing was

entirely satisfactory. They were exhibited in excellent condition. The value they placed upon them was as follows: Black Orpington chickens, $3\frac{3}{4}$ lb. to 4 lb., 4 to $4\frac{1}{2}$ months old, 3s. each; White Orpington chickens, 4 lb., 4 months old, 3s. 6d. each; Silver Wyandotte chickens, $4\frac{1}{2}$ months old, 3s. 6d. each; White Leghorn chickens, $3\frac{1}{4}$ lb., 5 months old, 2s. 9d. each; Silver Wyandotte hens, $5\frac{1}{4}$ lb., $1\frac{1}{2}$ years old, 2s. 3d. each; White Orpington hens, $5\frac{1}{4}$ lb., $1\frac{1}{2}$ years old, 2s. 3d. each; Pekin ducklings, $5\frac{3}{4}$ lb., 14 weeks old, 3s. each; Indian Runner ducklings, 4 lb., 14 weeks old, 2s. 4d. each; White Rock chickens, 5 lb., 15 months old, 3s. 6d. each; Pekin ducklings, 5 lb., 14 weeks old, 2s. 9d. each; geese, 9 lb., 4s. 6d. each; turkeys, 9 lb., 6s. 6d. each. These represented the prices ruling in September, which is not the best month for poultry on the London market. Of course, the cost of preparation, freezing, carriage, and marketing, must be deducted from the above prices. The most satisfactory return is that for White Leghorn chickens—2s. 9d. for a $3\frac{1}{4}$ lb. bird, at 5 months old. Probably had similar birds been landed in London in the early months of the year the returns would have been even better. Still for prime well-fattened birds the prices at present available on New Zealand markets are higher than could be obtained in oversea markets. Leading poulterers in Wellington could not obtain the supplies they required for the Christmas trade. They obtained for chickens, 7 lb. birds, from 13s. to 14s. a pair. Chickens weighing up to 6 lb. per pair realized from 7s. to 8s. Of course, these were the retail prices, but I know of large lines of cockerels that were sold at 9d. to $9\frac{1}{2}$ d. a pound live weight several weeks before Christmas. Many will doubtless reply that they could not get anything like these prices, but I am speaking of good-conditioned birds in uniform lines sold direct to city poultrymen. To obtain 9d. a pound for young cockerels in the feather must be highly profitable, and no export return is likely to approach it. At this rate the consumer necessarily has to pay a fancy price for poultry for the festive season. The ruling of such values can hardly make poultry popular, especially as the consumer has little or no guarantee that what he purchases is tender and of good quality. With a uniform supply of decent-quality birds and the general adoption of the system of selling by weight a demand would be created for poultry which would soon put a different complexion on the table-poultry business.

While the London prices quoted above can offer no possible inducement to New Zealand poultrymen, it is possible a profitable return may there be realized in the beginning of the year for the large number of young White Leghorn cockerels which are a drug on local markets.

BREEDING-STOCK.

A mistake often made is to endeavour to patch up for the breeding-pen a bird that has apparently recovered from some disorder. It is always a risky matter, and the mistake, of course, is discovered when it is too late. While a hen that has been affected with some affection may recover

sufficiently to pay for her keep, it is generally unprofitable to use a male bird that has had its health impaired at any time. A weakness probably remains, and it has, therefore, not the stamina it should have to ensure the production of healthy offspring. I have seen many cases of heavy mortality in young chickens as a result of using doctored breeding-stock. To ensure the most satisfactory results there must be no question as to the constitution of the parents.

WORK FOR THE DEAD SEASON.

February is one of the easiest months of the year on the poultry plant. Advantage may be well taken of the opportunity thus afforded of getting the plant in good order for the winter season by thorough spraying of the houses, cleaning up the runs, making any repairs and additions, and generally doing everything which will have to be neglected later on. The poultryman's slack season is very short, and when he is busy few primary producers have a more exacting time. It should not be forgotten now that the winter egg can only be relied upon when the birds are comfortable and can be thus maintained in their best condition.

DEPEND ON THE PULLET.

It is a mistaken notion to encourage birds to rest now with the hope of their laying better in the winter months; and inducing the false moult is as stupid as it is unprofitable. The less nature's course is interfered with the better. For winter egg-production no doubt the pullet is the most desirable bird. Those having the necessary plant will generally find it the more profitable policy to depend upon the pullet entirely, especially with the lighter breeds, and keep the bird going from the time she reaches maturity, forcing every egg out of her until her season is completed, irrespective of season and price of eggs.

GREEN FEED.

With the development of the system of concentration of the plant the provision of ample green feed, especially for the young stock in the spring, is imperative. Though it is now late in the day to talk of this, an endeavour should be made, where this important matter has been neglected, to put in some quickly maturing plant.

JUDGING THE AGE OF FOWLS.

Several times recently I have been asked if it is possible to tell the age of fowls by any definite signs. There is no sign by which age can be determined apart from the general appearance of the bird to the eye of the practised poultryman. Of course, before the animal is fully developed it will be obvious that it is a cockerel or a pullet, and even when the latter is matured the condition of the breast-bone will indicate whether it is a first or a second season bird. If the former the end of

the breast-bone is much more flexible than is that of the two- or three-year-old bird ; but apart from this it is impossible to tell with any degree of accuracy the age of a fowl. Successful poultrymen therefore deem it necessary to mark the web of the foot with a punch for age-determination. A punch for the purpose can be obtained for about 2s.

THINGS TO REMEMBER.

Fowls on farms are usually under and irregularly fed.

Remember that now is the time to clean up the plant. Dirt is the forerunner of vermin and disease.

In no business is capital and experience more necessary than in poultry-keeping.

To obtain the best results a fowl requires grain food, vegetable food, and meat food, as well as grit and clean water.

Many poultry-keepers make the serious mistake of not giving sufficient clean water and a regular supply of it.

The farmer should not expect his poultry to pay unless they receive the same care and attention as the other farm stock.

When a bird appears sick, isolate it from the flock. The majority of poultry-complaints are very infectious.

It is rarely found profitable to doctor a sick bird ; very often the cheapest treatment in the end is the use of an axe.

No definite rule as to the quantity of food to be given per head can be laid down. When laying a hen will eat double as much as when not laying. The poultryman must exercise due discretion in this matter.

Disease is a most fatal thing in poultry-keeping, because once it appears there is generally no way of fighting it. Prevention is the only safe policy.

Because you have succeeded with a few fowls kept as a hobby, do not let this induce you to rush into a large undertaking. The only safe course is to expand the plant as your knowledge increases.

Poultry thrive and yield good returns in so many different styles of houses that it is impossible to provide a plan to suit all locations and conditions.

Now that the chickens are half-grown it is a mistake to neglect them. To obtain the best results they require care and special feeding until they reach their full stage of development.

A crooked breast-bone injures the sale of a table bird, and to prevent this chickens of the heavier breeds at least should not be allowed to roost till they are three months old, and even then should not be put on a round or narrow perch.

In selecting a site for the location of poultry remember that rich land is not necessary. The ideal soil is a free sandy loam, with good drainage, lying well to the sun and sheltered from the prevalent bad weather of the locality.

WEATHER AND CROPS.

DECEMBER.

OFFICERS of the Department report as follows on the weather of the past month and the condition of the pastures and the crops :—

WHANGAREI.—Continuous westerly winds have been experienced. The rainfall from the 1st to the 27th was 3.15 in., the two heaviest rains being on the 13th (0.82 in.) and on the 23rd (0.83 in.). Pastures are backward, but still there is more growth than there was last month. Early oats are being harvested, and there is every prospect of a heavy yield. Late oats are very short in the straw and are disappointing. Mangels are being planted out now, and appear to be doing well. There is a slight increase in the milk-yield over that of last month.—*A. P. Speedy.*

OHAEAWAL.—In the Hokianga County and northwards a considerable warm rain has fallen at regular intervals, having a good effect on the pastures. In the Bay of Islands the westerly winds have been persistent, drying up any rain that has fallen in a short time, making the pastures dry and brown. There are a few good crops of maize, but others are not doing well. Oats are now being harvested, and are showing a fair amount of well-headed straw. Potatoes are looking well.—*W. J. Dunlop.*

AUCKLAND.—The weather, without exception, has been very unseasonable, being cold at times, followed by strong south-westerly winds accompanied by intervals of heavy rain during the greater part of the month. Haymaking was well-nigh at a standstill. Some of the grain crops which were not ready for harvesting had to be cut to save them from being practically ruined. Unless the weather soon takes up it will be very serious for the farming community. On the other hand, dairy-farmers are doing very well, and have no cause to complain of their milk cheques, which still constitute a record for the Auckland District. During the rough weather the orchards suffered in exposed places. Pastures are affording an abundance of feed for stock, and if the weather soon takes up everything will be very soon in its normal state again.—*R. Rowan.*

OPOTIKI.—The last month has been a very wet one, and farmers in many parts want to commence cutting. Oats are dead ripe. The hay season has also been very bad, several crops that were cut having had to be left in the paddocks to rot. Pastures are looking well.—*J. Case.*

HAMILTON.—Intermittent rains and occasional high winds were experienced throughout the month. The growth in pastures and crops has been very good, with the exception of potatoes, which are more or less blighted throughout the district. There is an abundance of feed.—*J. Kerr.*

CAMBRIDGE.—Good rains during the month, which have assisted all crops and pastures, but the weather towards the end of the month has been greatly against harvesting, especially haymaking. Pastures are very good. Maize is coming away fairly well, and turnips are just being put in. Potatoes are badly blighted in places through the district.—*A. A. Clapcott.*

KING-COUNTRY.—Another month with an excessive rainfall, accompanied by westerly winds, has been experienced in this district. The temperature has been warmer than in the preceding month. Pastures have improved in quantity, but the quality is below the usual standard for this month of the year. The inferior grasses and clovers have flourished, but the superior varieties have not responded much to the warmer weather. Soil preparation for winter crops has been seriously delayed. Shearing under dry conditions has been an impossibility. Unless the weather improves shortly harvest yields will be inferior in quality and quantity.—*B. Bayly.*

TE AROHA.—The weather of the past month has been most inclement, westerly and south-westerly gales, with heavy cold showers being the rule. At the time of writing (27th December) the weather appears more settled, consequently the oat crops promise

to turn out better than anticipated. Grain crops are looking remarkably well, and with favourable weather now onwards will be a record for this district. Maize crops are practically a failure, owing to cold winds and snaps of frost. Rape and turnip crops are very fair, and are free from fly, &c. Where sheltered, fruit-trees have escaped damage. The potato crops are excellent, and are only slightly touched with blight. There is abundant feed, and the milk-supply to date is above the average.—*J. L. Morris.*

NEW PLYMOUTH.—Most unseasonable weather has been experienced throughout the month, the rainfall having been phenomenally heavy, and the temperature low. On the 28th we had an exceptional rainfall. Pastures are looking well. This is not a grain-growing district, the Algerian oat, on account of rust, being the only kind grown. Nevertheless, both oats and wheat grown on the coast are looking very well, and promise a yield above the average. The inland crops are only fair. Potatoes are looking well, but the wind has destroyed most of the kumeras. The early sowings of maize have been a failure, but those sown this month have made good growth. Many crops of mangels have had to be resown. One or two farmers have sown a little Japanese millet, which is doing well. So far no hay has been cut, and on account of the weather more ensilage will be made. Shearing is very backward.—*R. E. Fairfax-Cholmeley.*

STRATFORD.—There has been a heavy rainfall for the month, but it has been of a warm nature, which has improved the look of the country. It has retarded shearing, however, and the working and sowing of the land for winter feed. Unless there is an early improvement in the weather the outlook for autumn and winter feed will be bad, as in most cases the hay is fit for cutting.—*A. F. Wilson.*

HAWERA.—The early part of the month saw a continuation of the cold boisterous weather of November, but during the last week or two good warm genial rains have fallen and still continue. Pastures and crops have benefited materially, and the outlook generally is much brighter. The wet weather is seriously interfering with haymaking, and in consequence ensilage is meeting with more favour than usual.—*A. J. Glasson.*

WANGANUI.—Frequent rains, almost continuous winds, periods of cold and absence of seasonable warmth generally constitute the weather record since the middle of October. December brought little improvement, although not so tempestuous as the previous month. Rain has fallen at frequent intervals, and wind has been much in evidence. The temperature, though somewhat milder and more equable, has continued unseasonable. With the exception of two or three days, there has been no really hot weather. The month ended with a rising barometer, and good weather prospects. Turnips, rape, and mangels require warmth to stimulate growth. Sunshine is required to mature and ripen cereals, and fine weather is needed for harvesting.—*C. Watson.*

OHAKUNE.—The weather continued unfavourable until the 29th, the 30th and 31st being exceptionally fine days. The rainfall recorded for the month was 7.66 in., making the total rainfall for November and December 16.63 in. Although raining continuously throughout the month, the rain has been much warmer and cold winds less prevalent, consequently pastures have improved considerably, and at present all classes of stock are sufficiently provided for. Shearing has practically been at a standstill. Cocksfoot lacks the even appearance desired, but may improve before it reaches its final stages of maturity. Both cereal and root crops growing in this district are, taken on the whole—lateness excepted—fairly satisfactory. Though there is at present a favourable growth in pastures utilized for dairying, a fortnight's continuous warm weather would give the grasses more body, thereby improving the milk returns.—*P. Barry.*

TAIHAPE.—December has been both very wet and windy, the rainfall being 5.67 in. Rain fell on twenty-one days, the maximum fall being 0.9 in. on the 23rd. The average fall for the corresponding month of the previous six years was 3.4 in. The last two months were the wettest months of the year. Pastures throughout the district are exceptionally good. The recent high winds have not improved the oat crops. The cocksfoot harvest does not promise to be nearly as good as last season, owing to the absence of rain during the spring.—*A. P. Smith.*

KIWITEA AND RANGITIKEI.—The past month has been very wet: rain fell on something like eighteen days. Although it has greatly retarded shearing, it has put all fear of a drought away. There was more rain than in November, but there has been an absence of high cutting winds. The season is going to be an excellent one for grass and crops right through this district. There is to be seen a beautiful rich greenness of grass extending right to the hilltops. What is really wanted now is more sunshine to harden the grass. Potatoes, turnips, rape, oats, &c., are only grown in small lots in my district, but what are to be seen look well.—*J. A. Melrose.*

FEILDING.—The weather has been very unseasonable—in fact, the worst on record for this time of the year. Crops of all descriptions have suffered more or less throughout the district, but maize and root crops should be very satisfactory. Pastures are looking remarkably well, and green feed is in abundance.—*W. Dibble.*

MANAWATU.—The weather during the past month has continued unseasonably rough and boisterous with gales and thunder-showers, rain falling on twenty-one days. The growth of crops is good, but the gales have had a damaging effect both on grain crops and grass-seed. All farm-work has been much retarded. Although there is plenty of feed, the quality cannot be good, as it is not giving good results in fattening or milk-yields.—*W. Dalgliesh.*

POVERTY BAY.—There were some serviceable rain-showers in December, with the result that crops and pastures have greatly improved. The pastures from a dairy-farmer's point of view are rather short, and this is curtailing the supply of milk to the creameries.—*W. Ross.*

Wairoa.—Dry weather conditions prevailed with high parching westerly winds sweeping the face of the country, burning up vegetation, and giving it the bleached appearance not usually seen until February. Heavy rain fell on the 18th and 19th of the month, which no doubt will freshen up the pastures, but may have a damaging effect on the potato crop.—*T. F. Mullaly.*

HASTINGS.—Strong winds increasing to gales continued up to the 19th, when about 80 points of rain fell. Since then the wind has moderated and frequent showers have fallen, the effect on late crops of rape, turnips, &c., being beneficial. Much more rain is still required. There is very little growth in pastures, green feed is only moderate, maize has a stunted appearance, turnips and rape are not doing well, and grain crops are light, as well as rye. Potatoes are not doing well.—*J. G. Parker.*

WAIKURAU.—The continuous high winds have dried the pastures up. About the 18th the wind fell and we had a good rain. From this date to the end of the month we have had light winds and showers, the pastures freshening a little. Maize has been retarded, and more rain is wanted for rape. Wheat is looking well, but oats have been badly affected by the winds. Potatoes are looking well.—*H. O. M. Christie.*

PAHIATUA AND WOODVILLE.—Again we have had cold winds and some late frosts, causing a blighting effect on almost every green thing that was exposed to the winds and frosts. Owing to so much rain everything almost that the farmer requires for winter feed has been difficult to get in. In many cases where it was planted it has had to be resown, or something else tried. Shearing is very late, owing to so much wet weather.—*T. Bacon.*

MASTERTON, CASTLEPOINT, AND AKITIO.—Intermittent heavy downpours of rain with hail occurred several times during the month, with some very cold nights, and an occasional frost, which damaged tomato and potato crops. Considerable further damage has been done to fruit, which is much slower in ripening this season. The backward season has had one advantage to farmers in connection with the late sowing of swedes, as many farmers now intend to sow swedes on the stubble land. The area to be laid down in this way will be much greater than was the case last season. Shearing has been delayed beyond all expectations with the very wet season experienced, and very old settlers state it is the wettest season known for over twenty years.—*T. C. Webb.*

CARTERTON.—December commenced with boisterous weather and exceptionally heavy showers of rain, the wind veering from north-west to south-east, and at times blowing with hurricane force. The oldest settlers do not remember having ever had such a continuation of heavy gales. In some cases the oat crops were beaten down by the wind. During the latter part of the month heavy rains were experienced, with more or less wind. Pastures and crops are looking fairly well.—*S. C. Ivens.*

WELLINGTON.—A fairly wet and windy month, with a marked absence of seasonable warmth. The good rainfall has to some extent counteracted the withering effect of the almost continual heavy and frequently cold gales. Pastures have been retarded in growth. Oat crops have been benefited by the rains. Blight is apparent to a small extent in potatoes.—*G. H. Jenkinson.*

MARLBOROUGH.—The weather during the whole month has been most unseasonable, being very cold, with continuous and heavy winds, several heavy falls of rain, snow on the high country, and in one instance a hailstorm. The crops, especially oats, have suffered badly, and in some cases, especially in the Upper Wairau Valley, feed is more scarce than it has been for years. A change for the better now seems imminent.—*F. H. Brittain.*

AWATERE.—The weather for the first half of the month was very boisterous, strong winds to gales having been experienced most of the time. Some of the early crops of barley and oats, especially in exposed places, had a fair percentage of grain blown out. The wind made it difficult to cut or stook the crops, and dried up the pastures. For the second half of the month the weather completely changed, being showery, with several heavy rains during the last few days. It has delayed the harvest, and is seriously damaging the barley and oat crops that are in stook. Drying winds are badly needed for the grain. However, the rain is having a most beneficial effect on the root crops and pastures, which are looking very green and are growing well. The crops of rape are very good. There will be plenty of feed this summer.—*G. Ward.*

WESTLAND.—The weather for the present month has been most unseasonable, and there have only been four fine days, but at the time of writing it seems to be quite settled again, and the days are warm, a change which is badly needed by the farmer. Fruit crops have suffered considerably, and only very small crops are looked for. There is still a good coating of snow on the ranges, which is remarkable for this time of the year, but it will soon disappear if the weather keeps as warm as it has now been for a few days.—*J. H. Walton.*

KAIKOURA.—Exceptionally dry weather prevailed for the first half of the month, north-west winds blowing in succession during the period. This was followed by good rains on the 16th, 17th, and 18th, which proved of immense benefit to the crops and pastures. The crops on the average are good, and some are now being harvested. Pastures are good, there being an ample supply of feed about. The season so far, from an agricultural point of view, has been excellent.—*W. S. Goodall.*

RANGIORA.—There has been a large fall of rain this month, and most of the rivers have been flooded. Crops are very backward from Porter's Pass to the Otira, owing to so much rain and north-west winds. Settlers are waiting for fine weather to put in turnips. There were two frosts during the month, but little damage resulted. Dry warm weather is now required, when crops would harvest well.—*A. Hughes.*

LINCOLN.—During the earlier part of December fine weather prevailed. From the 14th to the end of the month the weather, however, was, generally speaking, wet. As a result, haymaking and the harvesting of early barley and oats were delayed. Shearing, also, has been seriously interfered with. The storm of the 15th was responsible for heavy losses of newly shorn sheep. Hailstorms over a limited area did great damage to crops. A spell of fine weather would benefit the country.—*J. G. Scott.*

ASHBURTON.—December has been a very wet month, a record. Rain fell on fourteen days, the total fall being 6.62 in. There were twelve nights' frost, the highest being 8 degrees, on the 4th. The highest temperature in the shade was 75 degrees on the 8th. A heavy hailstorm passed over the upper portion of the district and threshed out hundreds of acres of crop and killed over a thousand sheep. In the back country shearing is being done with snow all round the shed. A considerable number of sheep are still unshorn on the plain owing to wet weather.—*C. Branigan.*

FAIRLIE.—The month set in with strong north-west gales. These continued until the 15th, when heavy rain set in. Very little fine weather has been experienced since. The rainfall for the month was 6.5 in. A good many newly shorn sheep perished during the bad weather. Rivers have all been very high, and a good deal of damage has been done to fences, flood-gates, and bridges. The wet weather has freshened up everything. Should warm sunny weather be experienced there will be a record yield of all crops. Shearing has been delayed, and hardly anything has been done on the farms during the past fortnight.—*W. B. Manning.*

TIMARU.—During the month there were light falls of snow on the downs, and heavy cold rains, the latter end of month saw heavy constant rain and floods, with odd days of warm weather. This has done a lot of good to all the crops, which promise now to give heavy yields.—*J. C. Huddleston.*

WAIMATE.—Wet and cold weather continues to prevail. The sun has most obstinately failed to shine, and the rain of 6.49 in. is phenomenal for December in this district. Several heavy hailstorms have occurred, and some damage was done to the crops of farmers and fruitgrowers. Several of the heavier grain crops are going down, though generally good headway has been made by crops and pastures alike. Winter-sown wheat and the earlier-sown Algerian oats look exceptionally well. Potatoes in some instances have suffered from late frosts, but good returns are expected. The small bird, probably owing to the excessive wet, has been somewhat destructive on the earlier crops and turnips, but all that is necessary to assure a bountiful harvest is seasonable weather. Feed generally is most plentiful.—*F. A. Macdonald.*

KUROW.—This has been one of the wettest months on record for this district, and there is no sign of the weather clearing at present. The crops are looking splendid, and farmers anticipate a good harvest. Warm weather is now required to ripen the crops. The harvest will be at least a month late. A large quantity of grass has been cut for hay, but a lot of it has rotted on the ground owing to the exceedingly wet weather. Shearing is at a standstill at present.—*G. Reid.*

OAMARU.—So far, this has been the best season here for a number of years. From the agricultural and pastoral outlook things never looked better. Last year the rainfall ending on 31st December was 14.91 in., while this year we have had a total of 22.50 in., made up as follows—viz., January, 1911, 3.20; February, 0.67; March, 1.31; April, 1.90; May, 0.59; June, 3.38; July, 2.01; August, 0.27; September, 1.87; October, 0.83; November, 1.72; December, 4.60. Grass is in abundance, and all grain and root crops are looking remarkably well. Potato crops are excellent, and no blight is in evidence.—*S. M. Taylor.*

PALMERSTON SOUTH.—The weather during the past month has been exceptionally wet and cold for this season of the year. All farm-work is being hindered, and is practically at a standstill. Pastures and crops are very good except in Macraes and Moonlight districts, where feed is backward owing to the continuous wet and cold weather. A bountiful harvest is assured, providing we get reasonably warm weather. Rape is doing well. Turnips and mangels are backward, and are making slow progress.—*C. S. Dalgleish.*

DUNEDIN.—During December the weather has been (with the exception of an occasional day) cold and wintry, with rain and hail showers. On Sunday, the 24th, a thunderstorm broke over the north of the city, which caused a lot of damage to crops and gardens. Very few farmers have sown their turnips as yet, as the ground is too wet, and in many cases the early-sown varieties did no good, and will have to be resown. The same applies to mangels. Except where sown very early the crop will be a failure. The oat crops are heavy, and have gone down with the heavy rain. Potatoes are very backward, and blight is showing in places. The hay crops are heavy, and some farmers have cut a few acres already, as the grass has been laid flat with the prolonged wet weather. The rain still continues, and the outlook for haymaking is not hopeful.—*J. R. Renton.*

TAIERI AND BRUCE.—The weather has been very unsettled during the present month, with cold rain and snow on the surrounding hills. Although the pastures and crops generally are looking well, if warm weather does not set in soon the harvest will be late. If much more rain is experienced the crops will be down.—*H. McLeod.*

STRATH TAIERI.—An unusually heavy rainfall for December, and pastures have come on splendidly. Cereal crops are assured. Turnips have got a splendid start, and are growing fast. The outlook for this district is very promising. Shearing is still very much retarded.—*W. Scott.*

BALCLUTHA.—The weather still continues very unseasonable, with hail, rain, and very high gales. Considering everything, the district is looking remarkably well. Farmers are very much hindered with the sowing of turnips owing to the unseasonable weather. Harvest will be much later this year. Green feed for the fattening of lambs is very backward.—*H. A. Munro.*

OWAKA.—The weather for this month has been very wet, accompanied by very cold snaps, which have kept all pastures and crops back from what they should have been at this time of the year. Shearing has commenced in parts, but its progress has been very much marred by the state of the weather.—*T. D. Urquhart.*

MANIOTOTO.—A stormy and unsettled December. During the month we have had no continuation of heat. Cereal crops, however, are looking well, although a little backward. Up to the present we have had a fair rainfall, which has been retained in the ground through the absence of the hot dry winds so common in this district. Pastures are in good heart. There has been a good strike of turnips, but in some places it has been eaten off by the fly.—*A. T. N. Simpson.*

CLYDE.—Splendid showers of rain have fallen during December, about 3 in. being registered in Clyde. As a result of the moisture feed is more plentiful than has been the case for many years, and stock of all kinds are looking well. Shearing, however, is being retarded, as rain (more or less) has fallen nearly every day. The present outlook for those engaged in pastoral pursuits is bright.—*T. N. Baxter.*

LAWRENCE.—The weather has been very changeable during the whole of the month, 3.30 in. of rain having fallen. Turnip-sowing is very backward on account of the wet

weather. Small birds have been very severe in some cases upon rape brairding. Plenty of warm weather is required from now onwards to bring on crops of every description. Shearing has been greatly retarded with wet weather. Harvest has every appearance of being late.—*R. Barron.*

TAPANUI.—Milder climatic conditions having prevailed, growth has been greatly improved in all directions, and there is abundance of grass in most localities. Cereals promise the usual satisfactory returns. The bulk of turnip land is now sown. Owing in most cases to the depredation of small birds many of the earlier-sown turnips had to be resown. The season promises good returns on the whole for the farming community. Roxburgh rainfall, 2½ in. for fifteen days. Tapanui rainfall, 3.33 in.—*W. J. McCulloch.*

GORE.—During the earlier part of the month the weather was very wet and cold, but during the past fortnight has been decidedly better, and there has been a good growth. Many farmers who sowed their turnips early have had to resow. Harvesting will also be much later this year, but should the next month or two be warm and favourable heavy yields should result.—*B. Grant.*

LUMSDEN.—Rain fell nearly every day in December, with occasional hailstorms. Potatoes have suffered severely from the late hail-showers. The oat and wheat crops in the district are looking very well, and the yield should be above the average. Farmers have had to put off shearing on account of the wet weather. Any turnips sown are looking remarkably well. There is an abundance of green feed. Should the weather be fine for the new year the farmers will be making a start on the grass harvest.—*W. S. S. Cantrell.*

INVERCARGILL.—The weather for the first two or three weeks in December was cold, wet, and very stormy, and, following on two months of similar weather, farm-work is very much behind. About the 20th of the month the weather cleared up, and since then we have had a spell of warm, sunny weather, during which farmers have lost no time in sowing turnips, &c. There is still a considerable area of turnips to be sown. Crops generally are looking well.—*J. R. Whyborn.*

LAKE.—Although at intervals during the last three weeks it has given promise of summer for a day or two at a time, and has been somewhat milder, the weather of December has been practically a repetition of that of the two preceding months. Southerly winds accompanied all rains, consequently the agricultural country and any parts exposed to the winds have not retained moisture and are now in a much drier state than they should be. Crops generally are backward, and harvesting promises to be late.—*A. Clarke.*

PEMBROKE.—The first fortnight was very squally. Heavy rain and also hailstorms were experienced about the middle of the month, the hail doing considerable damage to fruit-trees. The latter part of the month, although not as warm as usual, was much milder, and was freer from the strong gales. Frequent showers during the month have retarded shearing. An exceptionally good harvest is looked for.—*J. A. Griffith.*

THE FRUIT CROPS.

Officers of the Orchards, Gardens, and Apiaries Division report as follows on the condition of the fruit crop for December :—

WHANGAREI.—Moderate to strong westerly winds did some damage to young trees, but little damage has been done to crops. All classes of stone and pip fruits promise well. Tomatoes and vegetables on market in variety in good quantities and better quality than last month. Continued damp weather has assisted in the development of pear-scab in northern part of district.—*J. W. Collard.*

AUCKLAND NORTH.—Weather conditions very unseasonable, being one continuous series of violent storms culminating in semi-cyclonic gale on 18th, yet fruit-trees still carrying fair crops. Peaches well above average. English plums, light crop generally. Japanese plums, fruit improved through gales, thinning down without labour. Pears erratic; some varieties and districts show heavy crop, others very light, average fair. Tomatoes (outdoors) in some cases felt gale on 18th severely, but majority now growing well. Potatoes fair crop. Strawberries, crops seriously hampered by adverse conditions, but will carry fruit later than usual. Grape-vines looking well, with indications of fair average crop.—*W. C. Thompson.*

AUCKLAND.—High westerly winds to gales prevailed whole month with rain, heavy, at times. On 18th exceptionally heavy gale from west did some damage to fruit crops

but more especially to young trees in exposed positions. Crop prospects same as forecast last month. Apples, pears, Japanese plums, and nectarines heavy crop. Peaches good; tomatoes only moderate.—*W. R. L. Williams.*

GISBORNE.—Mostly a dry month with high winds, welcome rain towards end of month. General crop prospects much the same as last month, but if anything not so good, especially with nectarines, peaches, and apricots. Apples, pears, and grapes very good; heavy crops anticipated. Peaches, Japanese plums, nectarines, quinces, medium. English plums fair. Apricots considerably below average. Tomatoes, vegetables, raspberries, and currants very poor.—*W. R. L. Williams.*

AUCKLAND SOUTH.—Apples good to heavy; apricots very good; pears good to heavy; plums heavy; peaches and nectarines light to good. Potatoes poor to fair. Codlin-moth, very little, due to cold weather and rain, but no doubt will hatch out more freely when warm weather comes along.—*N. R. Pierce.*

HAMILTON.—Rough weather mentioned in my last report still continues, and as result trees are suffering considerable amount of damage, especially foliage, which in many instances has been greatly injured. In badly sheltered orchards loss of fruit has been fairly heavy, but in sheltered places trees are still carrying crops equal to that of average season. Irish blight is causing considerable amount of trouble among tomato and potato crops throughout district. Recent weather has been highly favourable to the spread of this disease where spraying has not been well carried out. The loss in this direction is likely to be serious.—*J. A. Campbell.*

WANGANUI.—Better weather showed improved results in orchard and garden. Apple and pear scab are prevalent, but where trees are properly sprayed disease has been quickly checked. With exception of tomatoes, vegetable garden crops are in excellent condition.—*W. C. Hyde.*

PALMERSTON NORTH.—Weather has been little better than last month, some unsheltered orchards being almost entirely defoliated. Marked absence of codlin-moth so far. Weather in some parts of district has been favourable for germination of apple-scab, and many of earlier varieties affected. Peaches and nectarines are showing well. Pears are looking very good on the whole, little fungus being noticeable. Gooseberry crop good. All varieties of plums well forward, and cherry plums from the district now being sold in shops. Tomatoes and potatoes are looking very healthy.—*Geo. Stratford.*

HASTINGS.—Apples and pears heavy; peaches good; nectarines medium crop only; raspberries light; plums fairly heavy crop; apricots very light. Garden produce has been affected very much by the dry weather, the result being very light crops.—*F. E. Nottage.*

BLENHEIM.—Apples good crop. Pears good average crop. Apricots very uneven; none in some places, owing to early spring frosts; peaches a fair average crop, especially where trees have been well tended and sprayed. Plums a fair average crop. Japanese plums fair average crop. Weather has been very rough, with high winds generally, but have not seen or heard of damage to fruit crop. Perhaps owing to climatic conditions codlin-moth is not in evidence as in previous years.—*E. Rabbits.*

NELSON.—The weather has been very rough, raining nearly every day throughout the month, with heavy winds. Stone fruits thinned a little, and also apples, but good crops will be pulled. Vegetable outlook is fair; tomatoes little late, but coming on well. The Moutere Hills orchards are putting on good growth, and large stretches of country are being prepared for planting.—*J. L. Williams.*

CHRISTCHURCH.—The continuous cold and wet weather has been very harmful to fruit-orchards. Cherry-growers have suffered a great deal, owing to cherries cracking badly on account of so much rain. Plums and nectarines are also cracking to some extent. Apples, expect fair crop; pears light; plums very light; peaches very light; apricots very light; cherries fair crop; tomatoes fair; strawberries light crop; gooseberries good crop; currants good; raspberries good; walnuts fair crop; nectarines very light.—*W. J. Courtier.*

TIMARU.—Apple and pear crop looking well. Cherries and strawberries damaged with wet weather. Other stone fruits looking well.—*J. H. Thorp.*

DUNEDIN.—Prospects of fruit-crop in apples, pears, apricots, and cherries good. Plums rather light, owing late frosts. Strawberries late, and not too well flavoured owing to wet weather. Considerable damage done to fruit in places by recent heavy hailstorms, apples and pears being badly marked in exposed situations. Vegetables scarce owing to late season.—*W. T. Goodwin.*

ANSWERS TO CORRESPONDENTS.

WORMS IN LAMBS.

“SUBSCRIBER,” Marua, Te Karaka, writes,—

Having heard that new milk and turp mixed was good for worms in lambs, could you tell me what quantity of turps would be a dose for lambs?

The Live-stock and Meat Division replies,—

If it is necessary to drench the lambs at all, lysol (about half a teaspoonful well diluted) is preferable to oil of turpentine. The dose of the latter for a six-months-old lamb is 1 drachm (about a teaspoonful). An article on the subject of parasites appeared in the *Journal* for July, 1910.

TUTU POISONING.

MR. R. G. KENNEDY, Tahora, Taranaki, writes,—

I read with great interest through your correspondence columns the particulars in regard to tutu and the different cures for affected cattle. I heard from a very old drover in our district of a certain cure in the case where a beast just falls with the first effect of the tutu, and that is to pull the beast's tongue out of its mouth as far as possible towards the ear. It seems to open the throat, and the poisoned gases from the tutu escape. I would very much like to hear further criticism on this subject. I mention this cure because I have actually seen it done when droving cattle through tutu-areas.

The Live-stock and Meat Division replies,—

Treatment of a beast suffering from tutu poisoning by pulling its tongue as far as possible out of the mouth towards the ear would be of very little avail. The amount of gas accumulated in the rumen, or first compartment of the stomach, is generally very considerable, and simply pulling out the tongue once, in order, as our correspondent states, to “open the throat,” I am afraid would not effect that object, and cannot be classed as a certain cure. A better plan, if anything is attempted in this direction to get rid of the gas, would be to cut a smooth, straight, round piece of wood, 2 in. or 3 in. in diameter, and about 10 in. or 12 in. in length. This should be tied into the mouth by cords carried from the ends round the back of the horns, a notch being cut all round at each end to secure the string. This acts practically as a gag, and should be tied tightly. A gag like this is often used in cases of choking, and when cattle are “blown up” through eating wet succulent clover, &c. The gag used here is generally the common household rolling-pin. The gag causes a rolling, champing movement of the jaws, and undoubtedly favours eructation of gases from the rumen.

TUTU POISONING AND SOFT-CHEESE MANUFACTURE.

MR. ARTHUR WASTALL, Willowbrook, Shortland, Thames, writes,—

In reference to tutu poisoning, I should like to learn if goats are liable to be affected by eating tutu.

Also, will Miss G. Nest Davies inform me where the literature on soft-cheese manufacture can be procured, and the title of the most comprehensive work on the subject.

The Live-stock and Meat Division replies,—

We have no data regarding goats eating tutu; still, as they are ruminants, it is probable that they would suffer in a similar manner to others of their order.

The Dairy-produce Division replies,—

The only book we know of which deals with the subject of fancy-cheese making is "The Practice of Soft-cheese making," by Tisdale and Robinson. This work is published by John North, Fetter Lane, London, E.C. No doubt local booksellers would be willing to order a copy for any one requiring it.

PIGS AND CALIFORNIAN THISTLE.

G. H. G., Gordonton, writes,—

Could you advise me as to what is the best crop to grow upon which to winter pigs? The paddock I propose to use had rape in it last year, and has since grown nothing but the native grasses. The soil is heavy drained swamp land. Also, what manures would be best to use with crop recommended? I have had very good results from grazing pigs upon green oats. Can I do better with another crop?

Can you inform me of the best and most effective way of dealing with Californian thistles?

The Fields and Experimental Farms Division replies,—

At the experimental farms it is found that pigs winter well on peas, mangels, and pumpkins. The last-named crop fed with a little grain has been found very suitable.

It is suggested that basic slag should be used at the rate of 3 cwt. to 5 cwt. per acre.

The best means of dealing with Californian thistle where the ground is suitable is continuous cultivation of the plot affected, either by ploughing or grubbing. Care must be taken that it is not harrowed so that any portion of the plant may not be dragged to other parts of the field. The plot might be skim-ploughed and a dressing of ordinary agricultural salt put on the bottom of each furrow. This gives the salt a better chance of getting at the roots. The plant might be sprayed with a mixture of 2 lb. arsenic soda to 52 gallons of water. In some cases a good dressing on top of salt has proved effective. There are numerous mixtures called "exterminators" on the market, but none of these have proved really effective. It is found that continuous cutting of the plant with a small grubber just below the ground, and not allowing the plant to grow above the ground, has given the best results. This tends to weaken the roots, and so gradually destroys the plant.

HORSE AND CALF TROUBLES.

MR. A. HART, Pah Farm, Waipu, writes,—

Will you give me information on the following:—

1. What are the symptoms of a horse when suffering from worms, and also what remedy should be applied?

2. I have a number of calves which, after being fed for about three weeks, begin to pass blood and die off in about a fortnight. The calves have been carefully fed with new milk for two weeks and then gradually changed to skim-milk. Would a bull with a poor constitution have anything to do with it? Some of the calves have revived, but a number have died. I would be pleased with any information as to treatment, &c.

The Live-stock and Meat Division replies,—

1. The symptoms shown by horses suffering from worms vary according to the variety of the parasite and its location. In most cases, however, the animal has a more or less unthrifty appearance, the skin being "hide-bound" and is scurfy and dry. The animal is often pot-bellied, especially in young animals. The appetite is capricious, but is usually good, although, as the horseman says, "his food does not seem to do him any good." Diarrhoea may be present, often alternating with the opposite condition—costiveness. If the parasites are located in the large intestines there is often a collection of a dirty-white furry substance round the anus. This is dried mucus, the result of the movements of the parasites, the consequent itching also causing the animal to rub its tail in order to get relief.

There is often a tendency for the animal to yawn, and elevate and rub the upper lip, and also lick the walls, manger, &c. The presence of the worms in the dung settles the matter of diagnosis at once.

There are four different kinds of worms usually met with in the horse. The most common one is the large round one known as the *Ascaris megalocephala*, found both in the small and large intestines, in the latter often in enormous numbers, and apparently doing the animal very little harm. They can generally be got rid of by feeding the animal on soft food for a few days—bran, carrots, &c.—and then giving him fasting a draught composed of oil of turpentine 2 ounces, oil of peppermint 10 drops, in a pint of raw linseed-oil (boiled oil is poisonous owing to the addition of white-lead, and should never be given). You can repeat the draught in about three days. This draught would also be useful in dislodging the so-called "pin-worm." This is a small worm generally found in the large bowels, particularly the rectum, and known as *Oxyuris curvula*. One or two enemas of warm water in which a handful of common salt has been dissolved may also be given. The other two worms are of a far more dangerous nature than the preceding, and the symptoms shown by the animal of their presence are unfortunately of such an obscure nature that they are of little use to a layman, who would probably mistake them for some other condition, or *vice versa*. Both kinds of worms have been met with in the Dominion, but fortunately to nothing like the extent of the others. Both are small round nematodes known as strongyles. One of them, the palisade worm (*Strongylus armatus*), is usually found in the small intestines, and if it would keep there would probably not do much harm. Unfortunately, during one period of its existence it has the habit of leaving the intestine and finding its way into the large blood-vessels, the posterior aorta and the mesenteric arteries being the principal ones. It causes dilations of the coats of these arteries, known as aneurisms, and often leads to the death of the animal. The other worm is the four-spined worm (*Strongylus tetracanthus*), and is often found associated with the preceding one. It is found in the walls of the bowels, and if in large numbers a fatal diarrhoea is often induced. Young animals are mostly affected, or at any rate it is more often detected in them, one symptom being soft persistent swelling of the sheath and legs, which "pits" on pressure.

Low-lying swampy ground is the favourable habitat of all classes of worms, and it is better to leave breeding alone if the land is of this nature, leaving it to those who have high, sound, or well-drained pastures.

2. I am afraid I am unable to advise you as to what the calves really did die of from description of symptoms given. It appears to have been some dietetic trouble. A bull with poor constitution might get weakly calves, but more than that I should not think he had anything to do with the immediate trouble. If any more cases occur, give about 2 ounces of linseed-oil and notify the Inspector of Stock for your district.

FRUITGROWING.

F. D., WHANGAREI, writes,—

I have a couple of acres of level land on a hill-top about 300 ft. high on which I was thinking of growing strawberries and fruit-trees. Will you kindly advise me through your *Journal*,—

1. Whether such a situation could be made to grow strawberries and other fruits successfully if two rows of shelter-trees were planted round it?

2. What other kinds of fruits would you recommend growing?

3. What would be the best trees to grow for shelter in such an exposed place?

4. Could strawberries, onions, potatoes, or maize be grown in meantime while waiting for shelter to grow?

5. I also have a hillside with a slope to east and north-east, and with a grade of about 1 in 3 or 4. Soil is fairly light—something between black soil and clay loam. Would such a steep grade be suitable for grapes, cherries, peaches, and oranges?

The Director of Orchards, Gardens, and Apiaries, replies,—

1. Land such as described could be made to grow strawberries and other fruits successfully provided that adequate shelter has first been established and is afterwards well maintained.

2. Apples and pears.

3. The black wattle (*Acacia decurrens*) provides a rapid-growing and hardy shelter.

4. It would be advisable to establish the shelter first, and commence cultivation later.

5. A hillside with a steep grade is unsuitable for such cultivation as is necessary for the fruits mentioned, on account of the washing-away of the loose surface soil during heavy rains.

LUCERNE-FEEDING.

MR. J. L. HENDERSON, Westmere, writes,—

Has your Department any information with reference to lucerne-feeding to cattle? If so, I should esteem it a favour to be advised in the matter.

The Director of the Fields and Experimental Farms Division replies,—

As green feed lucerne is valuable for all stock, very particularly for milking-cattle. It is improved by being permitted to wither or wilt. As with many other legumes, it appears more attractive to animals in that state than when freshly cut. As hay there is no other to compare with that of lucerne in nutritive value. There is, however, some difficulty in saving this unless the weather is fair, as the leaves are readily detached. In this the same applies to clovers, peas, and vetches. As an ensilage-plant lucerne is one of the most excellent. As a pasture-plant the greatest caution requires to be observed: it resents constant grazing. It is probable that it will not be so used in this country; its value for green feed and for hay will be so highly appreciated.

“BIDABID.”

MR. PETER BRASS, Raetihi, writes,—

I would be greatly obliged if you would let me know through your *Journal* if there is any known method of eradicating “bidabid.” I have a quantity of it that I would like to get rid of. I would also like to know whether the “bidabid” has any value as a food for stock.

The Director of the Fields and Experimental Farms Division replies,—

No special means has yet been described for dealing with this plant. Burning followed by grass-seed sowing and reasonable stocking is probably the only means of dealing with it. As grasses assert themselves, so the “biddy-biddy” or “piri-piri” becomes less prominent. It has little or no value as food for stock.

GRASS-SEED, GOATS, FRUITGROWING.

“INQUIRER,” Hikurangi, Whangarei, writes,—

I shall be pleased if you can give me any information in the *Journal* as regards the following questions:—

1. Best mixture of grass-seed for gum land after burn, at present in fern or manuka. The land is situated near Hukerenui, and part of the Puhipuhi, Block 7. Cattle and ultimately sheep to be grazed on it.

2. As regards keeping goats for the blackberry pest, can you give me any particulars as to the best fencing for them? Is there a profitable market for goats? I should like to get into communication with someone who has tried them, so as to purchase a few.

3. I have been told that if any farmer wants to start an orchard for commercial purposes the Government will provide trees for one acre, and also supervise, on condition the farmer provides the labour. Is this correct?

The Director of Fields and Experimental Farms replies to questions 1 and 2 as under:—

1. The Department itself is now testing for the best mixture of grass-seeds for gum lands after burning, and is not yet in a position to advise on the subject.

2. Wire-netting similar to that used for sheep is the best fencing for goats. Goats are now in demand for the control of noxious weeds. If it is intended to know about the market for goats as food, this has not yet been tested in New Zealand.

The Orchards, Gardens, and Apiaries Division replies as follows to question 3 :—

3. The Government does not provide fruit-trees for planting for commercial purposes. The conditions under which *fruit-testing* acres are established are :—

- (1.) The owner to place one acre of land at the disposal of the Government for a period of seven years.
- (2.) The Government will supply the trees and fertilizers, and the Government Orchard Instructor for the district will do the pruning and advise generally.
- (3.) The owner will undertake to perform all necessary labour connected with pruning, spraying, &c.

Fruit-testing acres are planted with a considerable number of varieties of several classes of fruits, usually one tree of each variety. They are also planted in conjunction with established commercial orchards, with a view to economy in working.

RYE-CORN.

MR. CHAS. TARRANT, Woodhill, Kaipara, writes,—

Will you through the *Journal* inform me if rye-corn cut green—heads just in flower—will be suitable for chaff. It was put in for green feed, but having a good bit left I have cut it with a binder and purpose chaffing it. One end of the paddock was mixed with oats (about half oats). Is this an advantage? The other part was simply rye-corn.

The Director of Fields and Experimental Farms replies,—

There is very little experience on rye chaff. Very little rye is grown in this country. It is probable that this chaff is not so acceptable to stock as that from oats. The stage at which it is being cut is the most desirable for chaffing.

VETERINARY QUESTIONS.

IN view of the fact that the *Journal* is only published monthly, and that some questions regarding the ailments of stock require immediate attention, it has been decided, in order to meet the convenience of stock-owners and to enable them to apply the necessary treatment without delay, that the Live-stock and Meat Division will reply direct to correspondents where the questions are of an urgent nature.

TOBACCO AS A PARASITE-DESTROYER.

WITH the object of testing dried tobacco-leaves (steeped in brine) as a preventive of internal parasites in lambs, all this season's crop of lambs at Ruakura Farm of Instruction have been fed daily on this material. It has been found that when once the lambs have become accustomed to the tobacco they eat it greedily, and apparently thrive well on the treatment. Mr. McConnell, the Manager, thinks there is something in the use of the tobacco as a preventive of parasites, but does not hold with the opinion that it is a cure.

SHIPMENTS OF PRIMARY PRODUCE FROM NEW ZEALAND TO UNITED KINGDOM.

COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.	Mutton, Carcases.	Lamb, Carcases.	Beef, Quarters.	Butter, Boxes.	Cheese, Crates.	Wool, Bales.	Wheat, Sacks.	Oats, Sacks.	Rabbits, Crates.	Hemp, Bales.	Tow, Bales.	Kauri- gum, Cases.	Sundry.
October, 1911	9,417	2,043	100	49,626	11,501	2,182	..	..	32,094	4,514	151	2,982	..
" 1910	49,010	800	10,531	60,014	9,159	3,189	94,815	23,330	36,947	3,632	1,232	3,089	56 carcasses pork.
November, 1911	47,770	10,427	403	135,741	57,319	44,934	15,833	..	16,606	7,844	2,183	3,085	..
" 1910	62,926	29,877	5,554	105,759	27,749	55,551	76,594	331	28,646	6,850	2,300	4,339	911 carcasses pork.
December, 1911	72,192	91,965	765	109,397	46,883	54,297	..	..	4,366	5,719	1,364	2,708	..
" 1910	82,405	157,172	13,155	182,051	67,162	59,080	..	..	9,716	4,524	109	5,363	686 carcasses pork.
January, 1911	175,337	287,120	13,568	90,405	46,375	127,139	..	16	399	15,234	3,302	7,094	590 carcasses pork.
" 1910	86,491	252,193	22,527	87,934	39,717	122,399	2,391	15,859	1,634	11,305	4,704	5,682	..
February, 1911	242,090	450,406	24,924	86,368	46,667	70,030	23,694	200	..	4,428	1,302	2,113	1,369 carcasses pork.
" 1910	196,093	414,408	23,795	97,766	62,192	102,182	4,724	8,600	..	4,223	2,314	4,827	1,719
March, 1911	264,297	665,822	26,657	45,912	40,668	58,362	40,276	..	..	3,650	1,583	8,982	2,408 carcasses pork.
" 1910	222,058	413,179	22,134	77,319	42,029	64,266	2,899	3,636	..	9,152	2,490	2,959	798
April, 1911	172,503	491,413	19,106	14,823	33,411	42,917	38,456	6	..	9,233	1,827	2,517	2,431 carcasses pork.
" 1910	202,120	559,166	29,355	46,524	44,032	32,920	21,855	1,934	12	10,179	2,951	4,250	627
May, 1911	204,390	377,105	20,173	995	20,732	33,033	93,854	..	..	7,443	1,210	7,720	1,087 carcasses pork.
" 1910	310,196	622,532	38,276	9,588	28,384	25,123	81,052	..	3,010	10,017	2,346	3,150	1,293
June, 1911	214,079	448,432	15,789	..	6,323	19,568	39,423	..	14,128	4,763	525	5,528	2,434 carcasses pork.
" 1910	299,596	555,777	60,286	485	17,963	21,260	13,707	..	8,988	6,180	2,684	7,104	658
July, 1911	206,869	260,761	14,296	..	276	14,100	29,452	..	10,334	6,022	1,073	2,786	175 carcasses pork.
" 1910	249,906	334,753	71,160	..	595	12,816	20,604	1,106	8,649	6,695	1,437	8,272	2,448
August, 1911	66,608	110,054	3,653	..	..	5,260	31,976	..	18,231	3,443	303	3,475	203 carcasses pork.
" 1910	94,468	97,899	16,440	634	..	5,381	33,970	273	22,629	1,978	720	6,793	362
September, 1911	102,081	40,057	6,059	6,404	..	7,390	38,151	..	33,059	5,604	393	7,672	220 carcasses pork.
" 1910	104,925	26,416	8,420	22,644	41	6,539	40,876	3,863	7,721	2,680	597	1,682	255

HEMP AND TOW GRADING RETURNS.

DECEMBER, 1911.

Hemp.—The total number of bales graded was 8,120, as compared with 13,233 for the corresponding month of last year, a decrease of 5,113 bales. For the twelve months ending 31st December the number of bales graded was 88,373 as compared with 130,449 for the previous twelve months, a decrease of 42,076 bales.

Tow.—During the month 2,306 bales were dealt with, as compared with 4,328 for the corresponding month of last year, a decrease of 2,032 bales.

HEMP AND TOW GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF DECEMBER, 1911.

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.	Common.	Rejected.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland	63	597	1	6	..	667
Napier	91	..	..	..	..	91
Foxton	6	1,173	2,115	22	13	..	3,329
Wellington	14	1,996	1,490	46	4	..	3,550
Blenheim
Picton	62	34	..	..	..	..	96
Lyttelton
Dunedin	3	23	59	..	..	..	85
Bluff	47	248	7	..	..	302
Totals	85	3,427	4,509	76	23	..	8,120
Percentages of total	..	1.0	42.2	55.4	0.9	0.5	..	100

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	10	60	..	..	70
Napier ..	..	29	..	..	29
Foxton ..	257	561	82	..	900
Wellington ..	306	627	168	18	1,119
Blenheim ..	..	..	..	..	..
Picton ..	34	..	5	..	39
Lyttelton ..	36	40	..	..	76
Dunedin ..	..	24	..	..	24
Bluff ..	..	21	28	..	49
Totals ..	643	1,362	283	18	2,306

Stripper slips passed for export at Wellington, 72 bales.

STOCK EXPORTED.

DECEMBER, 1911.

THE following table shows the numbers and descriptions of stock exported from the Dominion :—

Port of Shipment.					Horses.		Cattle.	Sheep.			Swine.
					To Australia.	To Pacific Islands.	To Pacific Islands.	To Australia.	To Pacific Islands.	To South America.	To Pacific Islands.
Auckland	..	..	..	..	28	16	12	..	59	..	40
Gisborne	..	..	..	..	..	..	..	..	..	..	..
Napier	..	..	..	..	..	..	..	..	..	..	..
Wellington	..	..	..	..	15	1	5	..	10	..	..
Lyttelton	..	..	..	..	12	..	..	134	..	62	..
Dunedin	..	..	..	..	1	..	..	14	..	20	..
Bluff	..	..	..	..	1	..	..	..	..	..	..
Totals	..	..	..	..	57	17	17	148	69	82	40

The following are particulars of the horses shipped: 35 draughts (26 mares, 9 geldings), 27 medium draughts (8 mares, 11 geldings, 8 fillies), 2 thoroughbred fillies, 2 hackney geldings, 4 light horses (2 mares, 2 geldings), 2 pony mares, 1 trotting-gelding, 1 Shetland phuy.

ARGENTINE TRADE WITH BRITAIN.

THE Department of Agriculture, Commerce, and Tourists has received the following cablegram from Buenos Aires, dated 6th January, 1912 :—

The following shipments of produce were despatched from the Argentine to the United Kingdom ports during December, 1911 (compared with December, 1910) :—

	1911.	1910.
Frozen beef (quarters)	104,000	57,319
Chilled beef (quarters)	166,000	154,635
Frozen mutton (carcases)	196,000	150,251
Frozen lamb (carcases)	122,000	95,661
Butter (cwt.s.)	11,393	5,340

STOCK IN QUARANTINE.

THE following stock was received into quarantine during the month of December :—

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
MOTUIHI ISLAND (AUCKLAND).					
1	Fox terrier ..	Female ..	London ..	T. E. Duck ..	Te Kowhai, Waikato.
1	Holstein bull	Male ..	Sydney ..	N.Z. Loan and Mercantile Co.	Auckland.
30	Romney ewes	Female ..	London ..	E. Mitchelson & Co.	"
1	Romney ram	Male ..	" ..	" ..	"
2	Holstein bulls	" ..	Sydney ..	N.Z. Loan and Mercantile Co.	"

SOMES ISLAND (WELLINGTON).

1	Jersey bull ..	Male ..	Melbourne	Mr. McCrea ..	Palmerston N.
2	Chihuahua dogs	Female ..	San Francisco	Mrs. Bedford ..	Ponsonby Road, Auckland.
1	Pomeranian dog	" ..	London ..	Mrs. Clulee ..	Dunedin.
1	Hereford bull-calf	Male ..	" ..	Chambers Bros. ..	Havelock, H.B.
1	Aberdeen Angus bull	" ..	" ..	A. S. J. Carlyon ..	Tikokino, H.B.

QUAIL ISLAND (LYTTELTON).

4	Border Leicesters rams	Male ..	Liverpool ..	J. B. Reid ..	Elderslie.
3	English Leicester rams	" ..	" ..	E. Kelland ..	Timaru.
1	Chow Chow dog	" ..	London ..	E. W. Jones ..	Christchurch.
1	Collie dog ..	" ..	" ..	J. Lilico ..	Invercargill.
2	Romney rams	" ..	" ..	J. G. Ward & Co. ..	"
1	South Devon bull	" ..	Liverpool ..	J. C. N. Grigg ..	Longbeach.
1	South Devon bull-calf	" ..	" ..	" ..	"
1	South Devon cow	Female ..	" ..	" ..	"
5	South Devon heifers	" ..	" ..	" ..	"
2	South Devon calves	" ..	Dropped on voyage	" ..	"
3	Southdown rams	Male ..	Liverpool ..	" ..	"
5	Southdown ewes	Female ..	" ..	" ..	"

THE BRITISH PRODUCE-MARKET.

HIGH COMMISSIONER'S CABLED REPORTS.

THE Department of Agriculture, Commerce, and Tourists has received the following cablegrams from the High Commissioner for New Zealand. (NOTE.—Quotations, unless otherwise specified, are average market prices on spot.)

London, 16th December, 1911.

Mutton.—The market is firm. There is a dull sale for all qualities, but stocks on hand are light, and small shipments are expected. Canterbury 4 $\frac{3}{4}$ d., North Island 4d., per lb.

Lamb.—There is a better demand. Australian supplies are increasing; the New Zealand stock is exhausted. Australian 4d. to 4 $\frac{7}{8}$ d. per lb.

Beef.—The market is very firm. A shipment of North American beef has not been made for three weeks. Stocks of New Zealand beef on hand are light. New Zealand hinds 3 $\frac{7}{8}$ d., New Zealand fores 2 $\frac{3}{4}$ d., per lb.

Butter.—The market is firm, and there is a good demand. The average price for the week for choicest New Zealand butter is 132s., Australian 127s., Argentina 128s., Danish 138s., Siberian 126s., per cwt.

Cheese.—The market is firm, with more inquiry. The average price for the week for finest New Zealand cheese is 69s. per cwt.

Hemp.—The market is quiet, but steady, at about quotations already given. New Zealand good fair, spot, £19 10s., fair grade £19, fair current Manila £20, per ton. Forward shipment: New Zealand good fair £20, fair grade £19, fair current Manila £20 10s., per ton. The output from Manila for the week was 26,000 bales.

Wool.—The market remains firm for all grades.

Wheat.—The market is very quiet at last quotation—viz., long-berried 35s. 6d., short-berried 34s. 6d., per quarter.

Oats.—The market is firm, with an improved demand. New Zealand oats, short sparrowbills, ex granary, 23s. 6d., per quarter of 384 lb.; Danish 19s. 6d. per quarter of 320 lb.

Beans.—The market is firm, owing to reduced supplies. New Zealand beans, f.a.q., new crop, 36s. per 504 lb.

Peas.—The market is very quiet; nothing doing. New Zealand peas, partridge, 39s. per 504 lb.

Cocksfoot-seed.—The market is firm. There are light stocks on hand.

London, 23rd December, 1911.

Mutton.—The market is firm, although there is a dull sale for all qualities owing to Christmas at about quotations already given. Canterbury 4 $\frac{3}{4}$ d., North Island 4d., per lb.

Lamb.—The market is steady. Argentine shipments are increasing 100 per cent. No change in prices.

Beef.—The market is firm. Prospects are favourable. It is reported American chilled trade competition at an end. New Zealand hinds 3 $\frac{3}{4}$ d., fores 2 $\frac{3}{4}$ d., per lb. Demand for Christmas. Prices have declined, as demand is expected to fall off after Christmas on account of high price.

Butter.—The average price for the week for choicest New Zealand butter is 129s., Australian 125s., Argentine 124s., Danish 136s., Siberian 122s., per cwt.

Cheese.—The market is firm, with hardening tendency. The average price for the week for finest New Zealand cheese is 70s. per cwt.

Hemp.—The market is steady. There is a better demand for hemp. New Zealand good fair, spot, £20. New Zealand fair grade £19 10s., fair current Manila £20 10s.. January to March shipments New Zealand good fair £20 10s., New Zealand fair grade £19 10s., fair current Manila £21, per ton. The output from Manila for the week was 29,000 bales.

Wool.—The market is quiet but firm. No change in prices.

London, 6th January, 1912.

Mutton.—The mutton market is firm. New Zealand stocks of mutton on hand are light, and are firmly held in few hands. In anticipation of small arrivals, quotations are nominal. Canterbury 4½d., North Island 4½d., per lb.

Lamb.—The market is quiet. Australian, a large supply, 4½d.; Argentine, plentiful, 4½d., per lb.

Beef.—The market is firm, with an improved demand. Stocks of New Zealand beef on hand are light; quotations are nominal. New Zealand hinds 3¾d., New Zealand fores 2¾d., per lb.

Butter.—The market is very firm. There is a general and active demand. Market is affected by expectation of light arrivals. There is a general confidence in the maintenance of present prices. The average price for the week for choicest New Zealand butter is 134s., Australian 131s., Argentine 130s., Danish 137s., Siberian 128s., per cwt.

Cheese.—The market is very firm. There is a good demand. The average price for the week for finest New Zealand cheese is 73s. per cwt.

Hemp.—The market firm with more inquiry—rather more active. New Zealand good fair, spot, £21 5s.; New Zealand fair grade £20 10s., all positions; fair current Manila £21 10s., forward shipment £22 5s., per ton. The output from Manila for the week was 25,000 bales. Stock of New Zealand, 508 tons.

Wool.—The market remains firm.

BRITISH PORK MARKET.

London, 10th November, 1911.

Pork is in big supply, and at a low price; the market is full of home-killed and Dutch, and the very best is only worth a shade over 6d. per lb. New Zealand pork is worth from 4½d. to 5d. per lb., but I think nearer the former, a price that certainly cannot pay. Bacon has come down in sympathy, and good Danish is now fetching only from 54s. to 60s. per cwt., so you will see that New Zealand bacon pigs would not be worth much if they arrived now.—A. CRABB, M.R.C.V.S.

POULTRY AND PIG PRODUCTS.

London, 12th December, 1911.

Eggs.—Prices are firm for new-laid, otherwise the market is dull, with a downward tendency; a large supply. Home 16s. 6d. to 28s., Russian 7s. 6d. to 10s., Italian 14s. to 16s., Danish 15s. to 19s., Austrian 8s. 3d. to 12s., Dutch 15s. 6d. to 22s., French 14s. to 19s., per 120.

Poultry.—The market is quiet, but firm. Chickens: Home 7d. to 9d., Russian 7½d. to 8½d., per lb. Ducklings: Home 7d. to 8½d. per lb. Turkeys: Home 9d. to 1s., Continental 7d. to 8½d., French 8d. to 9½d., per lb.

Bacon.—The market is quiet, but steady; a fair demand at rates named below. *Sides*: Irish 50s. to 60s., Continental 48s. to 58s., Canadian 48s. to 54s., American 48s. to 54s., per cwt.

Hams.—The market is quiet. Small business doing in large sizes; smaller sizes are scarce. Irish 78s. to 120s., English 90s. to 112s., Canadian 56s. to 67s., American 52s. to 62s., per cwt.

London, 9th January, 1912.

Eggs.—The market is firm, with a good demand. A moderate supply. Home 14s. to 17s., Dutch 13s. to 17s. 6d., French 13s. to 18s., Russian 9s. 6d. to 12s., Danish 12s. 6d. to 16s. 6d., Austrian 8s. 6d. to 12s., Italian 12s. 6d. to 15s. 6d., per 120.

Poultry.—The market is steady, but the demand only moderate. Chickens: Home 8d. to 10½d., Russian 8d. to 9½d., per lb. Ducklings: Home 9d. to 10d., Russian 7d., per lb. Turkeys: French 9d. to 10d., Continental 8d. to 9d., per lb.

Bacon.—The market is firm, with more inquiry. *Sides*: Irish 51s. to 59s., Continental 42s. to 54s., Canadian 48s. to 54s., per cwt.

Hams.—The market is quiet but steady. Irish 80s. to 112s., English 84s. to 102s., Canadian 56s. to 66s., American 50s. to 58s., per cwt.



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PRICE,
SIXPENCE.

FARM IMPLEMENTS.

PRIMOSE MCCONNELL.

RUSKIN, in his book "The Crown of Olives," makes a strong plea for the return to manual labour, and in describing how the modern implement has done away with the poetry of farm life he puts it thus: "Hand labour on the earth and the harvest of it brought forth with singing; not steam piston labour on the earth and the harvest of it brought forth with steam whistling." He seems to overlook the fact that, if the poetry of farm life has been done away with, so has a great deal of farm drudgery.

Modern machinery is not a whim for the moment: it is a creation of necessity. In the improvement of implements we seem to have made great strides during the past twenty years, but recent inventions of the great Tesla would seem to indicate that the next few years will see a greater advance than all the years that have gone before.

When we remember that Pliny speaks of "a harvester drawn by oxen" (possibly something in the form of a stripper), it should take

away some of the "We did it" ideas of the present century; and when we read that Tesla has invented a 25-horse-power motor that can be put in the pocket, as it were, we can easily imagine its enormous possibilities when applied to farm machinery; and that the adoption of motor traction is only a matter of a few years.

It is just as necessary to experiment with farm implements as with any other thing in connection with the farm, and it is one of the most desirable functions of an experimental farm to report as to the value of any modern implement and provide intending purchasers with an opportunity of seeing the improved implement he may desire to purchase in actual operation, so that he may assure himself of its efficiency or otherwise, before purchasing. The struggling farmer naturally hesitates before spending money on an implement that may, or may not, suit his purpose.

The first essential before purchasing a modern implement is to provide a house or shed for its storage when not in use. The annual loss incurred by allowing valuable implements to stand out-of-doors in all weathers is enormous. A well-cared-for implement may be in good working-condition at the end of twenty years, whereas a badly-cared-for one is a wreck at the end of five.

The next essential is the care of implements while working. Many of the present-day farm hands, and many farmers as well, are under the impression that if they can drive an implement round a paddock without upsetting it they are "fulfilling the whole law and the prophets," forgetting that the efficiency of a machine, to a great extent, depends on proper adjustment, clean, well-oiled bearings, driving-chains at right tension, the renewal of worn parts, tightening of loose nuts—in fact, the hand in charge of the modern implement needs to be a sharp man, and one who takes an interest in his work. I have seen many implements condemned through no fault of the machine itself, but through the gross carelessness and inefficiency of the man in charge.

The proper time to overhaul and repair a farm implement is immediately its work for the season is done. The common plan is to send the machine to the repairer a few days before it is to be used, with the result that the work for which it is urgently required is delayed, and such delays often cause irreparable loss and endless worry. If at the end of the season a machine does not require any repairs except what the farmer can carry out himself, it should be thoroughly cleaned and oiled, and immediately put under cover. If requiring repairs that can only be effected by a skilled workman, and circumstances render its immediate despatch to the workshop impossible, a note should be taken of the defects, otherwise they are very apt to be overlooked. Painting should be seen to, if required, and this work can be done on wet days. Fortunately, the working parts of machinery

can now be replaced, and in most cases a telegram giving a number is all that is necessary.

Every boy who intends becoming a farmer should have some knowledge of applied mechanics. Cadets or students on training-farms should have an occasional lesson in blacksmithing (including horse-shoeing), joinery, and harness-mending. Such knowledge is of more use than the knowledge, say, of how many bacteria it takes to store a ton of atmospheric nitrogen in a given time.

For the efficient working of hay implements it is necessary that the hay-paddock should be reasonably level. In early spring the field should be carefully gone over, and all obstructions in the shape of stones, pieces of wood, wire, &c., removed. Work is often delayed at a critical time, and much financial loss incurred, by the breaking of an implement, when the damage might have been avoided by a little timely care. On a large farm I have seen such breakages delay the harvest work so much that it meant the loss of several hundreds of pounds. Any obstructions in the shape of stumps, boulders, &c., which are not easily removed should be marked by a pole before they are covered with the crop.

The implement-maker has much to learn in the way of attention to small details. Many implements clearly show that the maker has not the required practical knowledge of the work the machines are intended to undertake. A certain implement (made in New Zealand) recently sent to this station, and of which I have the highest opinion as to its possibilities, arrived with many of its working-parts in such a non-efficient state as to lead me to infer that the maker's knowledge of applied mechanics was extremely limited. As a matter of fact, we had to spend two days in alterations at this end before it could be made to work at all. I am pleased to state, however, that the maker in question was ready to admit mistakes, and listen to suggestions, which is a very rare exception.

Some years ago I suggested to a noted firm of self-binder makers an idea for carrying the weight of the pole on the backs instead of on the necks of the horses. I was politely informed that, although the idea was an excellent one, it was a matter for the consideration of the farmer rather than the implement-maker. The plan I suggested was nothing new, being adopted by one of the Scotch mowing-machine makers forty years ago, and it is one which adds greatly to the comfort of the horses. It consists of an iron rod about 8 in. long and $\frac{5}{8}$ in. thick, which can be made so as to bolt to the top of a cart-saddle. Another rod, with long loops to act as travelers, is placed on the saddle-rods and connects the two. A chain is suspended from the centre of the rod, and attached to the pole, thus carrying all the weight on the backs of the horses, though the straps at the end of

the pole are still retained. The loops on the rod that connects the two saddles must be long enough to permit of them sliding backwards and forwards with every movement of the horses, and of course require oiling.

Implements are often sent out with glaring flaws smothered with paint, bolts round instead of with square shoulders, spanners that will only fit a few of the nuts, pinions insecurely fastened to the driving-axles, important bolts without check-nuts, and other defects too numerous to mention. The implement-maker should bear in mind that a farmer has not an engineer's shop in every paddock.

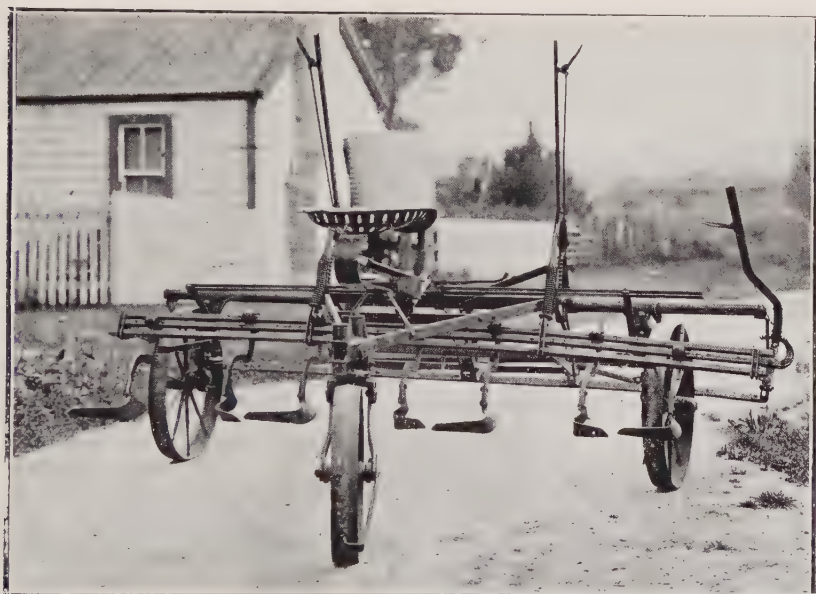
In making any comparison between British and American or colonial implements I am perhaps treading on delicate ground. Take implements such as hay-rakes, turners, tedders, horse-hoes, and mowers: compare the British with the others, and the veriest novice in mechanics must confess that the former are far ahead in the two main points—durability and finish. In many instances the foreign machine is a comparative toy; and I am speaking from a practical experience of both.

The American maker gets the credit of supplying a machine that will suit the needs of all customers. It is true, that in order to stifle competition, he will supply a machine to suit his client's pocket, which in most cases means "jerry-building." As to adaptability, with the exception of the self-binder, the American implement is still made to suit conditions as they obtain in America, not as they obtain in Britain or New Zealand. They are nearly all made for light work with mule or light-horse traction. The American binder, however, is undoubtedly an excellent machine, and an incalculable boon to present-day farmers. Yet even in the making of binders the British maker is coming rapidly to the front.

I was pleased to hear a native-born farmer in this district state the other day that he had lately imported a British horse-rake and mower, and, although the cost was considerable, he felt certain that he had the best implement of the sort in New Zealand. The British machine cannot compete with the American, because, being better finished, it costs more.

If the late inventions of Tesla are all that he represents, then the horse is doomed. For my own part I would not be sorry. Thirty years ago there seemed to be a fellow-feeling between horseman and horse, possibly because the labour was more equally divided between the two. Now that the work has been shouldered on to the horse, the sympathy between the two seems to have died. It is a case of employing some one else to do the work, and despising him for doing it. In the olden days I have known many men who would gladly have slept all night alongside their horses if they thought they would

increase the comfort of the animals by doing so. Now that this bond no longer exists, I will be pleased when the motor takes the horse's place, for I was brought up in a district where a man always puts his horse's comfort before his own; and the treatment which many a horseman nowadays gives his horse is to me a depressing feature in agricultural work.



A PLANET JR. TRIPLE HORSE-HOE, IN USE AT MOUMAHAKI EXPERIMENTAL FARM.
The cost of this machine is about £15.

GREEN-MANURING.

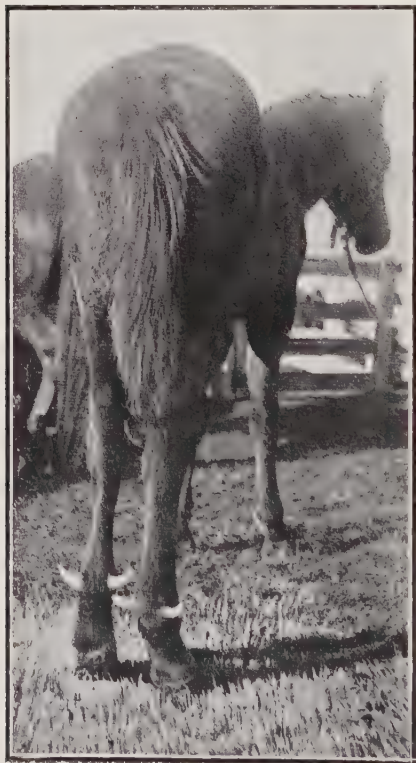
AN instructive demonstration in the reclamation of swamp land is to be seen at the Ruakura Farm of Instruction. A field of 5 acres of burnt-out swamp land—one of the poorest patches on the property—recently drained was sown to horse-beans. The land had been limed and manured with basic slag and bonedust, $1\frac{3}{4}$ cwt. of each, followed by a subsequent top-dressing of 3 cwt. of superphosphate. Two small plots had additional dressings, one of 2 cwt. of kainit and the other of 40 lb. of sulphate of ammonia. The crop of beans was a good one, particularly so on the better portions, but apparently the potassic and nitrogenous dressings had no beneficial effect. The bacterial nodules on the roots were very pronounced. To provide the desired humus the beans were ploughed under. The land is now to be planted in crimson clover, to be again ploughed under. Judging by past experience of reclaimed swamp lands at Ruakura, this double green-manuring is necessary to give the required heart to the soil and to render it fit for effective use.

UNUSUAL DEVELOPMENT.

HORNY GROWTHS ON THE FETLOCKS OF A FOAL.

W. W. H. EDWARDS, M.R.C.V.S.

I RECENTLY met with an unusual case in a foal. The animal exhibited large horny adventitious appendages of the skin projecting laterally from the posterior portion of the fetlocks; the small horny growths popularly known as "the ergots," and usually found in the coarse hair at the back of the fetlock, being absent in this case. The growths were particularly well marked on the hind fetlocks, those on the fore fetlocks being much smaller. The removal of the growths was easily managed; being simple appendages they were easily dissected off after an incision round the skin at their base. The photograph was taken by the kind permission of the owner.



The question arises, should these horny excrescences be considered as an instance of reversion to the condition found in some of the earlier forms of equine animals, or are they due to that tendency to reduplication of parts which occurs so frequently as a teratological condition, especially among domestic animals? The latter I think is the more probable. However, apart from the unusual character of the growths seen in this particular case, it may perhaps be of interest to recall that "ergots" represent the functionless vestige of the once large callous pad to be seen in this situation in the tapir and rhinoceros, and, in fact, in all animals in which this part reaches the ground in walking.

Tapiridæ (tapirs) and Rhinocerotidæ (rhinoceros) are mentioned, as they, with the Equidæ (horses, zebras, asses), are the only three *living* families of the suborder Perissodactyla (odd-toed ungulates). The tapirs have four digits comprising the foot in front (though the ulnar digit does not reach the ground) and three digits comprising the hind foot, each set of digits being supported by a large callous pad behind. The rhinoceros have three or four digits in the front foot and three digits behind, each again being supported by a large callous pad. In the Equidæ (horses, zebras, asses) we still find three, but only one functional digit wonderfully developed, which is enclosed in a large horny hoof; the two lateral ones being incomplete—mere splints, in fact—but known as the small metacarpal and small metatarsal bones, and the large callous pad being represented by the small “ergots.”

Chestnuts.—These small round or oval plates of horny epidermis, growing, like the hoof, from enlarged papillæ of the skin, are found on the inner face of the forelimb above the knee; and in the horse alone below the hock on the inner face of the metatarsus. The original nature of these has been much disputed, but in all probability they are traces of glandular structures originally of use as secreting some odorous substance calculated to enable strayed members of the herd to regain their companions. Such glands are common in the limbs of many animals.

VEGETABLE PARASITE PREVENTIVE.

A LITTLE-KNOWN dressing as a preventive of parasitic attacks on root and fodder crops is being tested at the Ruakura Farm of Instruction this season. It consists of carbonate of lime and crude carbolic acid, the proportions being 1 ton of lime and $2\frac{1}{2}$ gallons of the acid. One plot received $4\frac{1}{2}$ gallons of acid to 1 ton of lime. While a definite conclusion cannot be drawn from a single experiment, it is interesting to note that the mangels on ground so treated were free from the attack of the beetle in their early stages, while mangels on adjoining land were affected.



ROMNEYS AT THE WERAROA EXPERIMENTAL FARM.

ACACIA BAILEYANA.

A. W. GREEN.

RIGHT throughout the Dominion the silver and black wattles are found, but the genus *Acacia* is seldom considered worthy of a place in the collections of ornamental trees and shrubs. The very names "acacia" and "wattle" appeal to us as common, and on this account trees classified under such names are looked upon as more suitable for planting on waste land. Let a word be said here in favour of some of the flowering acacias, for without doubt several varieties of these rank high in comparison with other flowering-shrubs usually planted.

The photograph reproduced as a frontispiece to this number of the *Journal* was taken in August last. It shows a three-year-old *Acacia baileyana* in full bloom. Flowering as it does at a time when other trees have scarcely started to bud, the acacia has much to commend it, not only to the florist and gardener, but also to the apiarist. The pleasant hum of the bee can be heard by all who stop to admire this specimen, and while the photograph was being taken thousands of these little workers were gathering the sweet nectar.

Acacia baileyana is certainly the finest of its genus. The flowers, borne in great profusion, hang gracefully in long racemes of small light yellow balls, much resembling a chain of beads. These form a magnificent contrast to the beautiful glaucous green colour of the leaves, forcing one to appreciate how well Nature has blended her colours. Other advantages acacias have over so many other orders of trees are that they thrive readily on poor soil, are of rapid growth, and will exist under the most adverse climatic conditions.

The specimen shown in the photograph was raised from seed and was planted three years ago, and has attained a height of 12 ft. It has grown, however, under favourable conditions, but the growth is nothing exceptional.

The common name of this variety of acacia is "Cootamundra wattle," and is a native tree of Australia. This is only one of the many varieties of the beautiful flowering acacias, but space will only allow me to enumerate, without going into detail, the following, which are all worthy of cultivation: *Acacia cultriformis*, *Acacia leiophylla*, *Acacia retinoides floribunda*, *Acacia farnesiana*.

The best mode of propagating is by seed. Sow the seed either in boxes or in a finely worked seed-bed, and when the seedlings are 2 in. high pot them off into 3 in. pots. The plants soon become well-rooted, and can then be safely transferred from the pot into their permanent positions. If, instead of potting, the seedlings are allowed to grow large in the seed-bed much difficulty is experienced when transplanting. Before sowing, soak the seed for several hours in warm water. This will encourage germination.

A FUNGUS WHICH DESTROYS NEW PAINT IN GLASSHOUSES.

HORTICULTURISTS owning glasshouses have to fight many pests which attack their plants. They have now, however, to guard against a microscopic fungus which ruins paint soon after the inside of the house has been finished. Such a fungus has recently been described by G. Massee in the Kew Bulletin. The fungus flourishes especially well in hothouses. If present it usually develops in about a month after the house has been painted, and seems particularly fond of white paint. "Numerous small pale-rose-coloured specks appear on the paint; these specks gradually increase in size and change to a purple or sometimes a dark-red colour, suggesting the idea of blood having been sprinkled over the paint." These spread to several inches in size, bear fruit, which is scattered, and new infection started. The paint is ruined, and one instance is given where it cost £200 to repaint cucumber-houses. The presence of 2 per cent. carbolic acid in the paint, Mr. Massee states, will prevent the development of the fungus, which he has named *Phoma pigmentivora*.—T. W. Kirk.

KEROSENE SEED-DRESSING.

THE dressing of seed with kerosene as a preventive of the attack by the turnip-beetle has been tested at the Ruakura Farm of Instruction this year. The test has apparently proved that the treatment was efficacious. Undressed seed was first sown, and the crop was completely ravaged by the pest. On the same ground kerosene-dressed seed was immediately sown, and the young healthy crop has all the appearance of being entirely successful. This experience does not, of course, conclusively prove that the kerosene treatment was effective, but it is distinctly suggestive. The method of treating the seed was to spread it on a bag and apply sufficient kerosene to thoroughly moisten it, then allowing it to remain in the sun to become sufficiently dry in order to enable it to run easily through the drill. The idea of treating seed with kerosene as a preventive of attack by the turnip-beetle is not, of course, a new one, but the Ruakura experience is nevertheless very interesting.

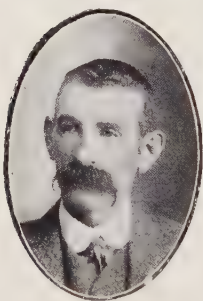
In the year 1909 there was used in Hungary 6,120 tons of carbon-bisulphide for the control of phylloxera.

HERD - TESTING.

A RECORD OF PRACTICAL EXPERIENCE.

Contributed by THOMAS McPHILLIPS, Manaia.

I STARTED testing my herd when the Dairy Division of the Agricultural Department opened the Cow-testing Association at Kaupokonui at the beginning of the season a year ago. At the end of the season I was surprised



MR. T. McPHILLIPS.

to find how little I knew about my most profitable cows. This was illustrated by a choice of my eight best cows which I made at the Department's request at the beginning of the first testing season. I picked good cows, but not the best, as one of the eight I picked gave only 290 lb. butter-fat for the season; and yet I had in my herd sixty-two cows which gave over this quantity. One cow in the herd was not selected, although up to the end of the season (July) she was the best cow in the herd and produced over 507 lb. of butter-fat.

The records of seventeen of the best cows are as follows:—

Order of Merit.	Milk. lb.	Fat. lb.	Order of Merit.	Milk. lb.	Fat. lb.
1	11,078	584.48	10	11,274	396.00
2	11,740	507.10	11	10,333	394.50
3	10,139	458.53	12	8,640	389.41
4	11,723	432.33	13	10,468	382.90
5	12,012	423.39	14	8,609	380.95
6	12,198	423.19	15	8,821	373.33
7	8,475	414.81	16	7,835	368.47
8	8,670	405.12	17	7,095	363.52
9	9,309	402.86			

Average—9,907 lb. milk, 417.69 lb. fat.

The figures for seventeen cows culled out as the result of the testing are given below :—

No.	Milk. lb.	Fat. lb.	No.	Milk. lb.	Fat. lb.
1	.. 6,937	227·06	10	.. 4,103	194·80
2	.. 6,810	224·79	11	.. 4,480	166·23
3	.. 5,656	224·22	12	.. 5,370	161·98
4	.. 6,173	222·22	13	.. 5,065	158·09
5	.. 6,537	219·31	14	.. 4,657	151·81
6	.. 6,666	212·64	15	.. 4,450	140·45
7	.. 5,819	212·32	16	.. 3,270	96·72
8	.. 5,967	205·02	17	.. 2,062	90·73
9	.. 5,916	199·62			

Average—5,290 lb. milk, 182·82 lb. fat.

The average yield of seventeen best cows was, 9,907 lb. of milk and 418 lb. fat; the average yield of seventeen cull cows was 5,290 lb. of milk and 183 lb. of fat; the average of the herd of 117 cows and heifers was 7,647 lb. of milk and 295 lb. of fat; the average of the herd (without those culled out) was 8,064 lb. milk and 315 lb. of fat.

LOSS FROM MILKING CULL COWS.

A point to which I wish to draw attention is this: for years I have been milking some cows which, as the result of testing, have now been culled out. Cows Nos. 14 and 16 (second list) were milked for seven years and, though fairly good cows, are now discarded. Had I had my herd tested seven years ago and culled out these seventeen cows and replaced them with others equal to the average of my herd, my saving would be figured somewhat as follows: The average cow without the culls gave 315 lb. fat; the average cow of those culled gave 183 lb. fat; the difference is 132 lb. fat per cow for one year. For seventeen cows for one year this loss of butter-fat would amount to 2,244 lb., which, at an average price of 1s. per pound, equals £112 4s. For seven years it would amount to £785 8s. Supposing that to do the weighing and sampling I had even engaged an extra man at 10s. per day for two days per month for ten months in the year, the cost would have amounted to only £10. The information gained would have been worth to me £100 per annum.

IMPROVING A DAIRY HERD.

I consider the production of our average cow in New Zealand is very low at present. Dairy-farmers, by testing their herds and finding out their best cows (and they can only be found by testing), can improve their herds by rearing the heifer calves from these best cows. It is just as essential,

though, that we should have some record on the male's side ; in fact, my experience has been that it is more essential that the sire should be of good dairy strain. Show cattle are perhaps right enough in their way, but I have little time for them excepting when backed up with records of milk and butter-fat production of themselves or their nearest of kin. I think too much attention has been given in the past to show points and not sufficient to milk-records ; and it is only by records that we can get at the milking-strain. We cannot expect to get a thrush from a blackbird's nest.

If we have some cows producing up to 400 lb. of butter-fat, and mate these cows to purebred bulls with a butter-fat record behind them equally as good, or better, and rear the heifer calves, I cannot see why we cannot build up herds the average cow of which will produce 400 lb. of butter-fat. As illustrating this, I had nine two-year-olds which averaged for last season almost 290 lb. of fat, and these should be equal to 400 lb. a year when mature cows. The records of these two-year-olds were :—

Order of Merit.	Milk. lb.	Fat. lb.	Order of Merit.	Milk. lb.	Fat. lb.
1	.. 5,964	340.10	6	.. 5,307	273.45
2	.. 6,423	326.32	7	.. 5,495	262.07
3	.. 6,263	313.85	8	.. 5,757	255.73
4	.. 6,217	296.40	9	.. 5,265	222.54
5	.. 6,324	290.22			

Average—5,896 lb. of milk, and 286.74 lb. of butter-fat.

To illustrate the difference in earning-capacity of two herds : One herd, say, is equal to the average of all the cows tested by the cow-testing associations last year, and gives about 220 lb. of fat, while the other herd gives 300 lb. of fat per cow per annum. Allowing 100 cows in each herd, the difference in the total yield of butter-fat per herd would be 80 lb. per cow, or 8,000 lb. of fat. Taking ten years as the period of usefulness of each herd, the difference in that time would amount to 80,000 lb. fat, which at 1s. per pound, would equal £4,000.

FEEDING.

Now that the time has arrived when dairymen must breed their own calves and rear them for their herds, it is essential that these good heifer calves should not be stinted. They should get new milk for six to eight weeks, and then, and only then, is the foundation laid for a good constitution and a sound cow. Not only do we get constitution, but that heifer will, the first year she is milking, pay for the proper care given her in the first six or eight weeks of her existence.

If dairymen would have their cows tested, find out the robbers and throw them out altogether, and keep only the profitable cows, these cows would pay better still, they would find themselves better off with

the smaller number of cows all of which were profitable. Cows must have plenty of suitable feed. It is just as essential to feed cows when they are turned out as when they are being milked. We must not think we are going to get 400 lb. of butter-fat from even a good cow if half-starved in winter. If cows have been done well when dry they will be at their best in three weeks after calving. If not, it will be about three months before they have built up their systems and can make their best returns.

KIND TREATMENT.

Kind treatment is just as essential right through the life of the cow as at any particular stage. My experience has been that we can never get the full return from a cow that has been abused.

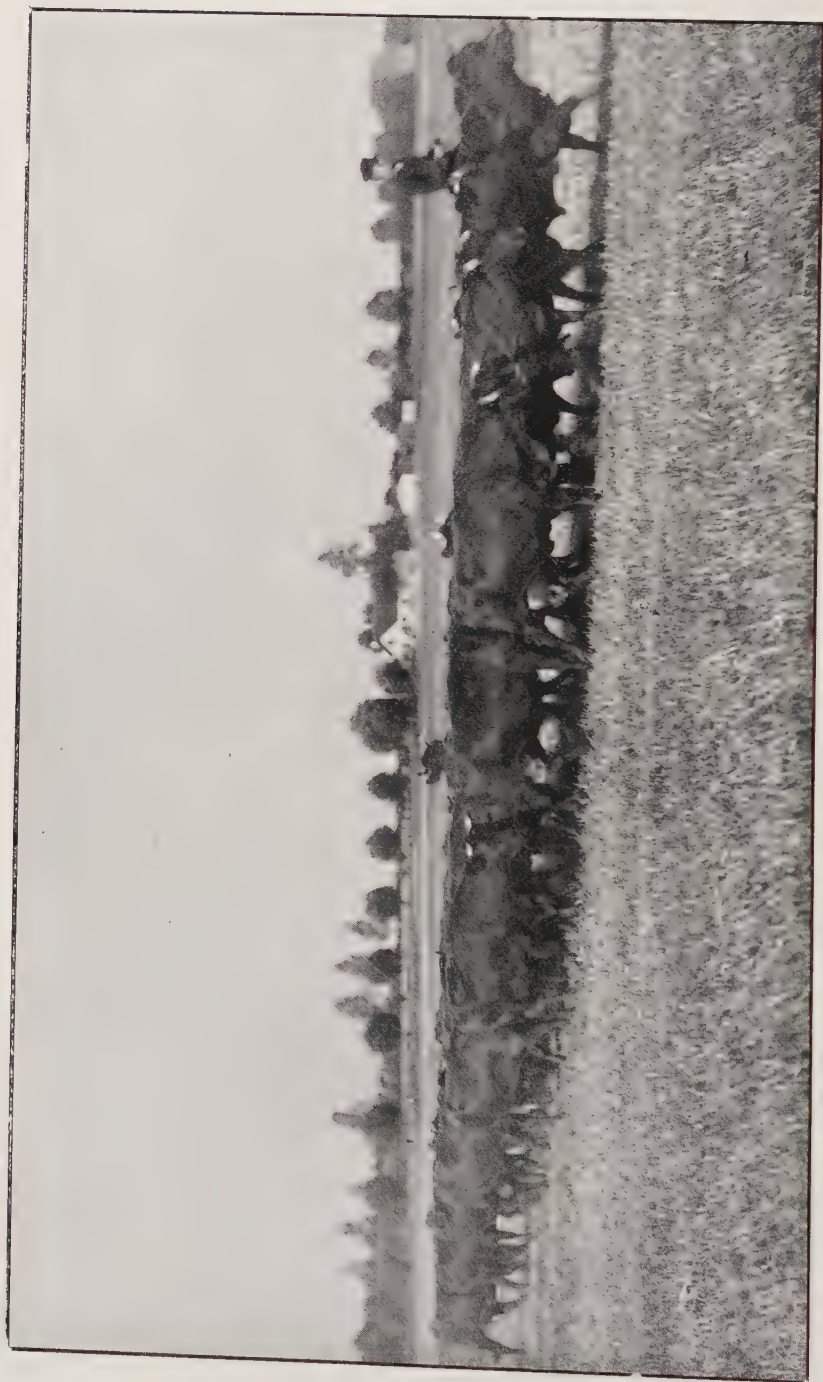
THE FUTURE.

I consider that the dairy business is only in its infancy. It is only by records and the use of a purebred bull with a milking pedigree that we are going to get increased production. There is a lot of room for improvement. Some people have an idea that a cow-testing association is not altogether what it ought to be; but I am thoroughly satisfied, for it practically worked out with my factory returns. Where dairymen are not satisfied, I think a good deal of the complaint is caused by conditions on the farms. Cows roughly handled or samples improperly taken cannot give the most accurate results.

NEW ZEALAND BUTTER.

REGARDING the prices of butter in London, a correspondent writes: "One of the points to mention is the little premium that Danish has had for some time past over New Zealand produce, a matter of a few shillings only. In a dear market like we have had for months, the tendency is for all descriptions of butter of the choicest grade to approximate in price. I see by Continental reports that New Zealand butter has sold in Berlin on a parity with Danish and Dutch. That is an interesting and important fact, and one may fairly accept this piece of news as valuable confirmation of the wise system prevailing in New Zealand of strict Government grading. A point in favour of high rates for Australasian butter during the 1911-12 season is the terrible foot-and-mouth scourge prevailing in Germany, France, and other Continental countries. In Germany 35,000 cattle herds were affected; and in Normandy it is anticipated that not 20 per cent. of the cows will calve, owing to the effects of the disease—*Australian Field*."

Two thousand and forty-eight Jersey cows were under test in Denmark in 1910 in four districts.—*J. H. Monrad, in "Hoard's Dairyman."*



BRINGING IN THE COWS ON A DANISH DAIRY FARM.

DEVONSHIRE CLOTTED CREAM.

MISS G. NEST DAVIES, N.D.D.

ONE of the finest luxuries prepared in a dairy is Devonshire clotted cream. It was originally made in the County of Devon, in England, and is to-day chiefly prepared in Devon, Cornwall, and Somerset. It is extremely rich, thick cream, containing about 60 per cent. of fat, and is prepared as follows:—

(1.) The milk, whilst still warm, is brought into the dairy and strained into open pans, similar to those used in shallow setting but rather deeper, holding a layer of milk of from 6 in. to 8 in. deep.

(2.) The pans of milk are allowed to remain undisturbed in a cool dairy for from ten to twenty-four hours, so that the cream may rise to the surface. The length of time allowed for setting varies with the weather and kind of milk. In summer the time given may be only about ten hours, for fear of souring taking place, whereas in winter twenty-four hours or more may be allowed.

(3.) After the cream has risen to the surface, scald by gradually bringing the milk to a temperature of about 175° Fahr., or until a wrinkled appearance develops and spreads all over the surface of the cream. In the farmhouses in Devonshire the heating is commonly performed by placing the pans of milk on the kitchen range or hob, or by means of hot water, as used in the special “steamers” or Devonshire-cream stoves. In order to obtain the characteristic burnt flavour, which is really due to burnt milk-sugar, the heating should not occupy less than half an hour.

(4.) The pans must now be rapidly cooled down by placing in a tank of cold running water, and when properly cold the cream will be found thick and clotted, and may be removed with a perforated skimmer, though commonly the pans are allowed to cool of themselves, but this takes quite twelve hours. In very hot weather, or when the clotted cream is required quickly, the milk may be scalded at once without any previous setting, and the cream then allowed to rise.

Separator cream is sometimes scalded, but when done this way it is impossible to get it to resemble the properly prepared clotted cream, as there is a lack of the characteristic flavour.

The best clotted cream is produced from rich milk, such as is obtained from the Channel Island and Devon cattle, but there is no reason why this product may not be produced from any milk of good

quality. Devonshire cream is in great demand, especially when fruit is available, and is sometimes sold by the pound at the same price as butter, but the price realized at Home usually averages 1s. 6d.

It is packed in wide-mouthed pots or tins, the latter fitted with lever lids, being the most suitable for postal purposes. Owing to the scalding or pasteurization which both cream and milk receive in this process the keeping properties are greatly increased. In summer the cream should keep from three to four days, and in winter longer, and this without the addition of any preservative.

ENSILAGE.

DURING last month the ensilage instructor of the Department, Mr. W. Dibble, conducted demonstrations on several Otago farms, principally in order to test the utility of Californian thistle as a silage material. Stacks were built solely of thistles, of thistles mixed with oats, and of thistles mixed with wheat. In one case a mass of waste material from a phormium-mill was placed in the centre of a stack. In another instance, where a large quantity of old wheaten straw was available, layers of this were used with rye-grass and red clover (utilized in a very succulent stage) in order to discover if the straw could be thus made more digestible for stock. The different stacks ranged from 80 tons to 240 tons in capacity. In all instances a liberal quantity of salt was used. Full reports on these trials will be published in the *Journal* in due course.



GRANNIE'S GIRL, THE DAM OF THE YOUNG BULL, GRANNIE'S CAMPANILE SULTAN, AT THE HEAD OF THE JERSEY HERD OF THE RUAKURA FARM OF INSTRUCTION.

A season's record of 678 lb. of butter-fat has been credited to Grannie's Girl.

LUCERNE IN MARLBOROUGH.

LUCERNE is rapidly becoming recognized by farmers on the rich Marlborough flats, where much of the land is composed of accumulated river-silt deposits, as a fodder crop of unexcelled feeding-value. In the congenial environment six crops can be taken in the one season for hay-making purposes, and then winter feeding is provided. This means that seven to eight tons of the finest hay known to commerce can be obtained off the one acre. Local experience goes to show that the only



CUTTING A FOUR-WEEKS GROWTH OF LUCERNE ON ADAMS BROS'. FARM.

dangers to the lucerne field are excessive water and such close grazing that other grasses smother out the lucerne. The method of planting generally practised is to plough the grass land in the autumn, cultivate in the spring, followed by harrowing and rolling. The best results are obtained from seeding thickly, using 20 lb. to 25 lb. of seed to the acre. On one property, that of the Messrs. Adams Bros., an interesting experiment is being tried. A field of 17 acres thickly infested with Californian thistle has been seeded down heavily to lucerne, and it is the belief of the

Messrs. Adams that they will thus be able to absolutely eradicate the weed within four years. The system they are adopting warrants the hope that their prognostication will probably prove correct. The thickly growing lucerne is being continually cut, but not too short, and only in winter will the land be grazed. This process is strengthening the lucerne and



THE CULTIVATOR USED ON THE ADAMS BROS'. FARM FOR TEARING UP THE GROUND IN THE WINTER.

The special point to the tines is shown in the diagram.

weakening the thistle. The usual policy of these growers in establishing lucerne—and they have 200 acres under this crop—is to seed heavily and allow the first cutting to remain on the ground, for the reason that whereas lucerne comes away quickly at first it then makes slow growth, when if weeds become established they rapidly choke out the lucerne plants; but if the young lucerne—6 in. to 9 in. high—is cut and left on the ground the mulch checks the weeds and the lucerne stools out and increases in vigour. No

return is expected the first season. Last year the Messrs. Adams made off a 17-acre field of lucerne £10 an acre from the seed, and this in addition to a good crop of hay and grazing from the middle of April, when the seed was carted off the paddock, till the following September.



CARTING IN MARLBOROUGH LUCERNE HAY.

BLACK AND GREY HAIRS IN WOOL.

A WOOL TRADE COMPLAINT.

THE Bradford Chamber of Commerce has issued a circular to wool-growers, a copy of which has been forwarded to the Department, in regard to black and grey hairs in wool. The circular states: "As the trade in pure white goods has been developed to an enormous extent and is one of the most important branches in the industry, the Wool Trade Section of the Chamber strongly desire to impress upon all growers the importance of exercising such action as they may deem expedient to remedy these difficulties, and recommend: (1) That farmers should not breed from black or grey sheep; (2) that the greatest care should be taken in selecting rams from flocks as free from black hairs as possible; (3) that black and grey lambs be slaughtered."

As far as this country is concerned, it would appear that the trouble will always exist, or at least so long as rams of the black-faced breeds are largely used as fat-lamb sires. The recommendations of the trade, however, should be borne in mind by those who follow the practice of using left-over black-face crossbred ewes for breeding purposes. As the presence of black or grey hairs must result in the value of the whole line being depreciated, it is obviously against the interests of the grower to use for breeding purposes crossbred sheep in which these undesirable fibres are likely to be found. Of course it is sometimes impossible to avoid using left-over black-face crosses. These should, however, be fattened at the first available opportunity, and care be taken not to allow any black-faced strain to permanently enter the flock. Quite apart from the question of a fleece being probably deteriorated in value by the presence of black or grey hairs, black-face crossbred ewes in the breeding-flock are seldom as profitable as well-framed longwool ewes, either from a wool viewpoint or that of the best fat-lamb mother.

Having just completed my inspection of the vineyards and vine-houses in the Hawke's Bay District I have to report on the very promising prospects for a good vintage. The vines, both table and wine varieties, are heavily laden with fruit free from mildew and other disease. The dry weather experienced in the district, and the long continuance of westerly winds, have been, no doubt, highly favourable to their present condition. The different classes of wine being put out by the leading makers in this district still maintain their character for purity and lightness, and are in demand on the market.—*S. F. Anderson.*

GREEN FODDER FOR COWS.

T. W. LONSDALE.

THERE is no more simply grown or more useful fodder for the dairy cow than combinations such as barley and tares, rye and tares, or oats and tares. In view of the experience in such a season as the present, when maize for feeding in the green stage has generally proved unsatisfactory, the crops in question should specially appeal to the milk-producer. They can be grown at any season of the year, and thus can be planted at the dairy-farmer's convenience. Such combinations are not only valuable milk-producing foods, but the tares being legumes these crops do not leave the soil in the same state of plant-food exhaustion as do many other plants. The manuring required is very light in proportion to that demanded by other crops, the tares and grain responding to a light dressing of a phosphatic manure. Not only are they to a certain extent soil-renovators, but they serve the excellent purpose of cleaning the land, and thus save much subsequent work in preparing the land for following crops. Areas of such combined fodders may be planted in succession, thus providing a constant supply of ideal fodder for the herd. An example of this is demonstrated at Moumahaki this season. To maintain the milk-flow of the Ayrshire herd at a maximum standard rye and tares were planted in October last, and barley and tares in November.

The method of production adopted at Moumahaki is very simple. The soil has carried a variety of crops for some seasons, and was in fairly good condition when cultivation was commenced. Rolling, to consolidate the light soil, followed the ploughing. The tine harrows were used twice, when the seed ($1\frac{1}{2}$ bushels of tares and 1 bushel of barley) was drilled with the ordinary grain drill, $1\frac{1}{2}$ cwt. of superphosphate to the acre being applied with the seed. The land was then rolled. When the crop was showing above the ground the tine harrows were again used, a two-fold advantage being thus gained—the weeds being controlled and the moisture conserved. This was all the treatment the crop received, and notwithstanding the exceptionally adverse weather experienced the result, as pictured, shows the methods employed to have been effective. Both of the Moumahaki crops should give over 20 tons of green feed per acre.

Last April a small area of barley and tares was planted at Moumahaki. This gave excellent feed in the very early spring; and, favoured by the spring influence, a capital second growth was produced, which was ploughed under to provide the light soil of the farm with the desired humus. This second growth would also, of course, have furnished good feeding in the hot weather.



BARLEY AND TARES AT MOUMAHAKI.

THE PROPER METHOD OF STOOKING.

PRIMROSE McCONNELL.

THE stook herewith illustrated gives an idea of how the sheaves ought to be placed in order to resist a reasonable amount of wind and rain.

A good stook cannot be made if the sheaves are tied too near the stubble end, as the weight of the ears and the long length of stalks between ears and band causes a proportion of the ears to hang down, and leaves the whole sheaf too open at the top.



A RUAKURA STOOK.

If the sheaves are placed with a good slope as shown in the photo, the ears pressed firmly together so as to form a sharp top on the stook, at the same time giving the sheaves a downward pressure with hand and knees, the stooks will resist much wind and rain. Stooking is an art which few men now possess. In a badly made stook the sheaves are simply dumped down close together, with the result that the top of the stook is left quite open, thus giving rain easy access; and a slight puff of wind blows the whole over.

Of course, any kind of stooking does for good weather (in fact, if the weather could be guaranteed, there is no necessity to stook at all); at the same time, it is always wise to make the stooks as if the worst weather were a certainty. The man on the binder can make the work of stooking much easier by unceasing attention to the adjustment of the binding-table.

Proper nourishment is just as essential for plants as for animals.

GUM LANDS.

SOME GRASSING EXPERIMENTS.

J. DUNCAN.

IN order to ascertain the grass and fodder plants suitable for cultivation on the poorer gum lands of the North, the Fields and Experimental Farms Division has been conducting experiments to this end. These are practically in their initiatory stage, and definite conclusions cannot therefore be laid down at the present time. It may be instructive, however, to those concerned in the problem, to know how the tests are proceeding. The experiments are being conducted on special plots at Kaitaia and Okerama, in the Whangarei district.

In laying out the plots, in the early part of last year, some difficulty was experienced in securing the necessary labour, but this was eventually overcome by larger areas being worked than was at first intended. The land is of a very broken nature, owing to it having been worked over for gum, which left innumerable pot-holes and hummocks. A number of grasses were planted purely for testing purposes. These comprised *Festuca arenaria*, *Festuca dumetorum* (Chilian fescue), *Agropyrum Smithii*, *Phalaris commutata*, *Phalaris caroliniana*, *Paspalum dilitatum*, *Paspalum virgatum*, *Chloris gayana*, and *Agropyrum repens*. The following seed was also sown: Waipu red-top, *Lotus major*, vetches, and oats, and several varieties of clover (white, red, and alsyke). Soya beans were also grown. All the plots are either adjacent to the railway-line or the main road, and can thus be readily inspected by farmers interested.

When I visited the plots in last December, all the grasses were doing very well, *Festuca dumetorum* especially giving promise of proving a valuable grass for the environment. *Festuca dumetorum* is a fescue of a very fine nature, and forms a splendid sole; it is said to possess good feeding value.

The oats, peas, and vetches planted on 4 acres at Kaitaia in last October, the land having been twice ploughed, showed most satisfactory growth—rich-coloured plants of vigorous development. It is intended to use this crop for green-manuring, in order to test the value of the added humus on subsequent crops. In the autumn, varieties of grasses which the experience now being gained points to being most suitable for the country will be planted on this plot.

The Soya beans were most promising. These also will be utilized for green-manuring.

A section of the experimental land at Kaitaia is to be subsoiled by the plough, to determine the value of this system of draining such lands. The subsoiling is now under way.

Thirty acres, which were ploughed the first time in the early spring, are now in fallow. This land will be ploughed again in the autumn, preparatory to being planted in the late autumn. Past experience points to this system of fallowing being the most suitable treatment for such soils.

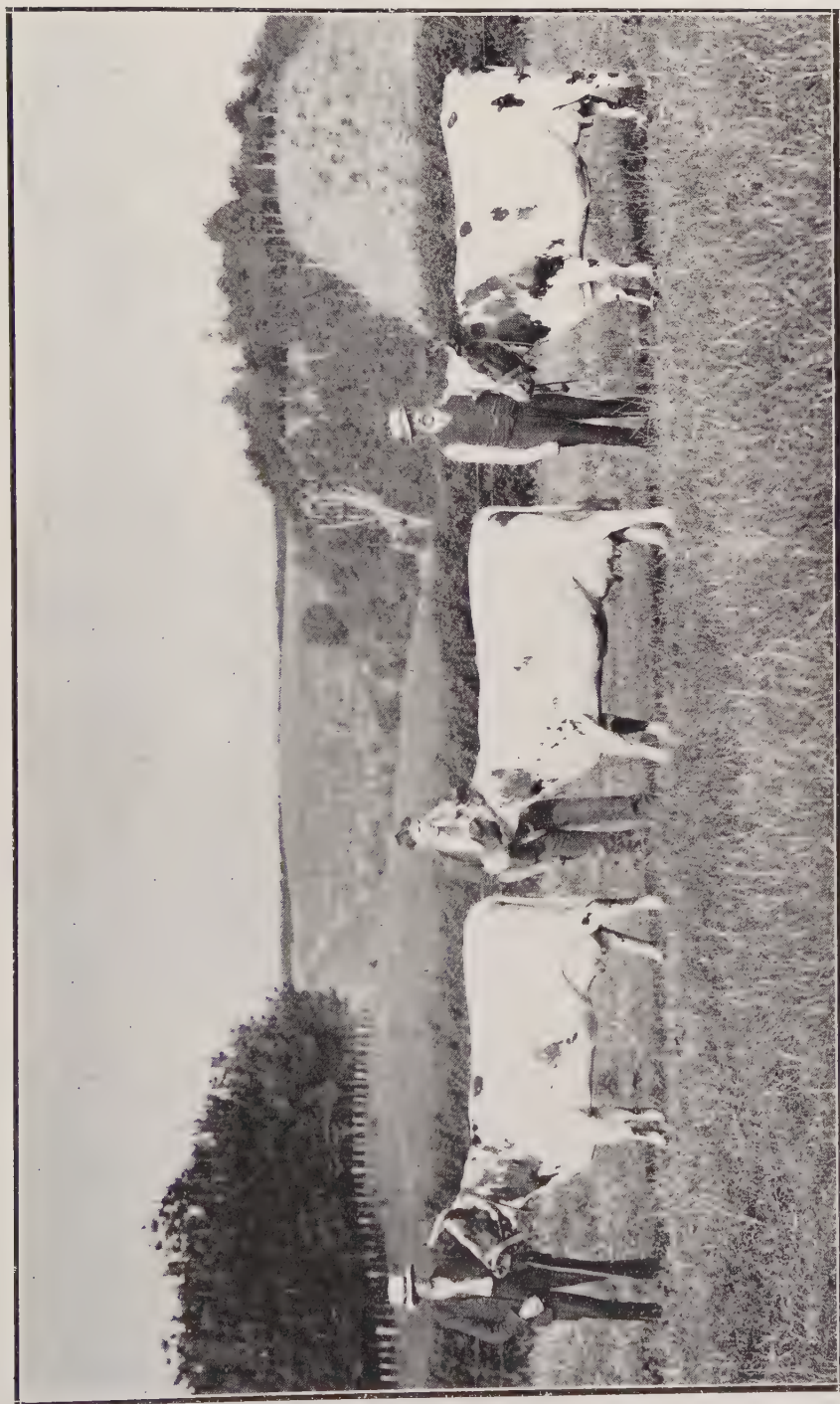
Further plots at Otaika, in the same district, are to be laid out. Probably a portion of these will be devoted to testing varieties of fruit-trees, the lay of the land being most suitable for this purpose. The plots are about seven miles from Whangarei, on the Main South Road.

SOFT-CHEESE MAKING.

THE soft-cheese expert of the Department, Miss G. Nest Davies, N.D.D., is now busily engaged in conducting practical demonstrations in the art of which she is an exponent in the South Island. She has introduced the approved methods of manufacturing soft cheeses to the factory of the Taieri and Peninsula Milk-supply Company's factory in Dunedin, and is now working in the Christchurch district.

A great many applications have been received for the assistance of Miss Davies from all parts of the Dominion, from farmers as well as from dairy companies. It is apparently not generally understood that the manufacture of soft or fancy cheese is limited to the supplying of a local demand, with the exception of one or two varieties, which may be exported; and that to establish the business on a payable basis the local demand has, first of all, to be created, an undertaking which demands some expenditure. Fortunately, several concerns, notably the Taieri and Peninsula Company, which are in a unique position for introducing such delicacies in large centres of population, have taken up the business. The sound pioneering work such firms are able to accomplish is the best guarantee that the consuming public of the Dominion will be educated to appreciate fancy cheeses and thereby bring about the demand which must precede a general system of manufacture. It is not expected that these special cheeses, which are relatively more costly than the ordinary cheddar of commerce, will be consumed on a large scale. Private makers would therefore do well not to undertake the manufacture of soft cheese until they are sure there will be a sale for it.

With a view to testing the Home market, and also to ascertain how the cheese will carry from New Zealand, several small consignments of Cheshire and Caerphilly cheese will be made at an early date, and, properly packed, will be consigned to England. If the results prove satisfactory no doubt some dairy companies will be prepared to ship regular supplies when market conditions are favourable.



MEMBERS OF THE AYRSHIRE HERD AT THE MOUMAHAKI EXPERIMENTAL FARM.

May-flower, 4 months in milk ; 4,282 lb. ; test, 3'8. Vina, 4 months 1 week, 5,305 lb. ; test, 3'9. Harebell, 7 weeks ; 1,792 lb. ; test, 3'7.

LONDON INSPECTION OF DAIRY-PRODUCE.

THE WORK INITIATED.

REPRESENTATION of the Dairy Produce Division of the Department on British markets is now well established. The officer in charge, Mr. W. Wright, formerly grader in charge at the Port of Patea, has settled down to his work, and has already been able to furnish valuable information to the grading staff at this end and to producers in general, more especially in regard to the quality of our butter and cheese as it opens up on the Home markets.

BUTTER-QUALITY.

While the quality of the majority of New Zealand brands of butter examined is reported on as satisfactory, the trade, it is said, has complained seriously of that of a few brands, and the official inspection supported the complaints except in one or two instances. In one case a firm contended that a butter graded "second" in New Zealand was really of first-grade quality. The London grader found on inquiry that the London criticism was based on a sample taken when the butter was in a frozen state, and that when he sampled the line when defrosted the grading at the port of shipment fairly represented the quality of the butter as it reached the market.

The butters about which chief complaint was made were either made from whey or from home-separated cream. In one or two instances, however, distinctly unsatisfactory quality characterized the butters turned out by well-equipped establishments conducted on the whole-milk system, the butters displaying a tendency to fishiness.

At Bristol strong complaint was made of the quality of a home-separation butter. A butter made without salt or preservative opened up stale in flavour, although the trade made no complaint as to its quality. The defect was noticeable in several lines of the same brand inspected by the London grader. On the other hand, several brands unsalted but containing a certain amount of preservative were found to be sweet in flavour.

At Glasgow the Inspector had an opportunity of examining a number of brands of New Zealand cheese, which he found to be giving satisfaction on that market, several brands being very highly spoken of. The chief fault found in the cheese examined in London was irregularity in quality.

MOISTURE-CONTENT.

In several cases butters made in leading factories have contained a percentage of moisture dangerously near the legal limit, one brand being found with a water-content exceeding the maximum allowance. Reporting on this case, Mr. Wright says: "From information I have received at this end quite a number of our best factories seem to be aiming at the 16 per cent. and working as near that amount of moisture as possible. It would be much better for the reputation of our dairy-produce if we were content with a lower moisture-content. We would then at least retain the confidence of the buyers and users of our butter. At present there appears to be a growing suspicion in regard to our butter in this respect. If this is allowed to continue it must end in financial loss to our producers, as if buyers can obtain other brands of butter showing a safer margin of moisture-content they will naturally pass over New Zealand produce in favour of it."

FOREIGN PRODUCE.

Opportunity was afforded the Inspector to examine rival butter and cheese. One sample of Danish butter was of fair flavour but slightly sour to the taste; the other had been a little scorched. "We have met just the same flavours in our own butters sometimes," he comments. The Siberian butter was stale and off.

English cheddars were decidedly disappointing to the New Zealand grader. They showed excessive acid, and the texture was gone. Flavour was also defective. One sample, however, was a very nice cheese, mild in flavour and of fine body. Generally speaking, Canadian cheese was found to be rather closer in body than ours. Some had a nice waxy body, but others were inclined to pastiness. Flavours ranged from fair to an inclination to "off." Generally they were milder in flavour than New Zealand cheddars. Dutch cheese, partly made from skim-milk, was clean in flavour, but tough on rubbing between the fingers.

DEFECTIVE WORKING.

It was found in more than one case that a line of butter, or part of a line, had been branded with a special mark to distinguish it for a purpose, but the marking was so roughly done that it led to confusion, a simple letter being scribbled on the boxes, with blue pencil in some cases and red in others. The shipping companies in particular complained of this unsatisfactory system.

A TROUBLE WITH CHEESE WEIGHTS.

A number of complaints have been made to the London inspector regarding carelessness in marking the weights on cheese-crates. Cases were found where the numbering of cases had been duplicated. Then, one case

was marked "167 lb." on the one end and "164 lb." on the other. Considerable differences in loss of weights were found in one line. The first three crates turned out had lost 6 lb., but the next three exhibited a loss of 13 lb.

BRANDING INDIVIDUAL CHEESE.

A case came under the Inspector's notice which demonstrated the utility of branding each individual cheese. A crate had reached a Margate retailer in a badly damaged condition, so much so that the purchaser was under the impression that the New Zealand cheese had been removed and others substituted. The Home grader was, however, able to prove that the cheese came from a New Zealand factory by reason of the brand stamp, which could be deciphered although the cheese was covered with mould. "This branding of cheese," observes Mr. Wright, "is of considerable importance, as it enables the buyer to recognize the product when he buys it, and, again, as in this instance, it quite settles any doubt as to the identity of the cheese." The buyer of the cheese in question was well satisfied with the quality, which found favour with his customers.

CHEESE-PACKAGES.

Many complaints are made by the trade as to the packing of our cheese. Failure to nail the centre boards to the battens was pointed to by a Glasgow firm, which also complained that the crowns of the cheese came away with the centre boards, thereby causing considerable financial loss. The head of the firm declared that 1 in. centre boards at least should be used, and these should be securely nailed to the battens. The use of scale-boards was recommended.

The Inspector met with a line of medium cheese which had been crated without any dividing material whatever between the two top and the two bottom cheese. A case was opened and the cheese separated, when it was found that the crowns of the cheese where these had come in contact with each other were quite soft and white. Naturally, it was only a question of time when these cheese would become practically joined together and the skin destroyed.

A London firm is very emphatic in its opinion that no cheese should be shipped without scale-boards. It declared it had known losses of as much as 7s. on individual cheese, which would have been obviated had scale-boards been provided.

Reporting generally on the crating of cheese, the London Inspector remarks that he would like to see it arriving in something like the condition of the butter-packages. At the present time the packages too often present a soiled and unsightly condition.

CHOU MOELLIER AT MOUMAHAKI.

As a dry-weather forage for milking-stock chou moellier has proved a decided success at Moumahaki Experimental Farm this season. Three acres are under the crop, which in three months of unfavourable weather developed to a stage which represented about $30\frac{1}{2}$ tons of green material to the acre. It is being cut and carted to the cows, which eat it greedily. Of course, the first cutting or the first eating-off of chou moellier is only a portion of the forage obtained from it. At the time the feeding of the French cabbage was commenced there was an abundance of herbage in the pastures, but from a milk-producing standpoint it was unsatisfactory,



CHOU MOELLIER AT MOUMAHAKI.

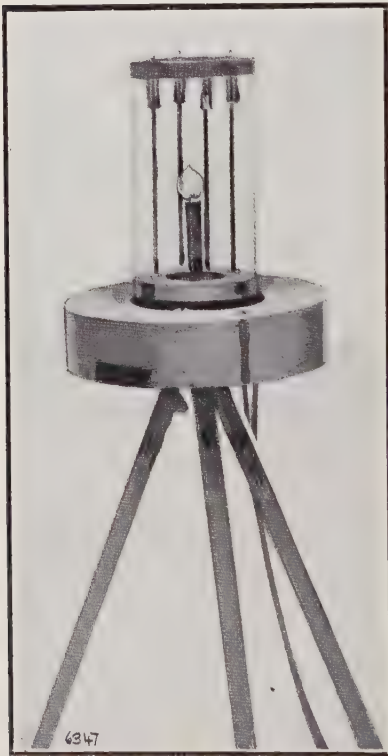
as the yield of the herd was steadily diminishing. Almost from the first day the chou moellier was fed the milk-supply commenced to improve, the cows rapidly attaining their maximum capacity. The crop was grown on a worn-out pasture, which was broken up with a digger plough, and then rolled and disced. The manure applied was $1\frac{1}{2}$ cwt. of basic superphosphate, $1\frac{1}{2}$ cwt. of bonedust, and 28 lb. of sulphate of potash per acre. The seed was drilled on ridges, 4 lb. to the acre being employed. This seeding is heavier than usually adopted, but the extra quantity was used in order to ensure a good braird, a precaution very useful in the event of adverse growing conditions, whereas if abundant growth results thinning

is a simple corrective. A portion of the area has been enclosed for feeding off by ewes and lambs. This experiment has proved decidedly satisfactory. Both the old and the young sheep took at once to the new fodder, and have thrived amazingly on it. The only time the sheep were off the feed was when heavy rain set in, when they were removed to pasture, this being done on account of the heavy growth of the chou moellier as well as to provide a change.

The general experience so far at Moumahaki is that chou moellier may be used with success when fed out to cattle and when fed off to sheep, though the test in regard to this is the first of the kind at Moumahaki and the first to be recorded in this country.

FROST'S ELECTRIC SCREEN AND INSECT-DESTROYER.

THIS is the invention of Mr. W. M. Frost, an American. It consists of an electric light and electrified wire screens. It is claimed that insects are attracted by the light and, on striking the wires, are, so to speak, electrocuted. The inventor claims that it will be useful in exterminating codlin and other moths. Our experience in New Zealand is that the codlin-moth is seldom attracted by light. The codlin is not a night flier. Our experiments have again and again demonstrated that though with various lantern devices we catch hundreds of moths of the army-worm and other species, it is most unusual to trap a single codlin-moth. It is, however, very probable that the invention may prove valuable in catching the moth of the army and tomato caterpillar, also possibly the beetle of the grass-grub. An outfit has been acquired by the Department, and will be tested in fields and orchards. The invention, it is also claimed, can be applied to wire-gauze door and window screens, so that flies and other insects alighting on these screens are killed.—*T. W. Kirk.*



FROST'S ELECTRIC SCREEN.

THE EXPORT FRUIT TRADE.

A NOTE.

T. W. KIRK, F. L. S.

FRESH fruit to the value of over $10\frac{1}{2}$ millions sterling is annually imported by the United Kingdom. Of this, British possessions supply £1,554,670, foreign countries £9,132,236; total, £10,686,906. Of this $10\frac{1}{2}$ millions, £2,250,000 are for apples and £600,000 for pears.

These figures show that the United Kingdom alone can utilize all we shall be able to send for years to come, provided quality and price are right. Moreover, Germany, India, and South America are now taking considerable quantities, and yet the trade with these countries is only just commencing.

There can be no doubt that with thorough co-operation amongst growers, coupled with proper cool carriage, it is possible to develop practically inexhaustible markets for temperate-climate fruits in countries as yet hardly touched, including Canada and the United States during their "off" season. Surely the spirit of co-operation will prove as strong amongst fruitgrowers as amongst dairymen. If so, there is no reason why fruitgrowing should not in time rank with our foremost industries. Without hearty co-operation the business will progress like the snail—"surely" it may be, but oh, how "slowly"!

The areas at present under fruit in the United Kingdom and her principal possessions are:—

					Acres.
United Kingdom .. .. .	..	..	..	..	355,177
India (including vegetable - gardens : separate figures not available)	..	..	..	..	4,020,136
Ceylon .. .. .	..	..	..	..	1,016,138
Canada .. .. .	..	..	..	..	491,720
Cape and Natal .. .. .	..	..	..	..	110,180
Jamaica .. .. .	..	..	..	..	63,029
Australia .. .. .	..	..	..	..	178,796
New Zealand .. .. .	..	..	..	..	33,839

The orchard area of this Dominion has been increased by over 5,000 acres in three years, as shown by the following:—

					Acres.
1908 .. .. .	..	..	..	..	28,554
1909 .. .. .	..	..	..	..	30,424
1910 .. .. .	..	..	..	..	31,769
1911 .. .. .	..	..	..	..	33,839

The districts showing the greatest expansion during the period named are :—

					Ares.
Otago and Southland	..	..	..	..	1,630
Nelson	..	..	..	..	1,300
Auckland	..	..	..	..	1,100

These figures show that co-operative measures, such as were taken by the exporters of dairy-produce, must soon be adopted if trouble is to be avoided. Growers, get busy !

WEST CANADIAN APPLES.

WRITING from Vancouver, under date 28th November, 1911, the New Zealand Trade Commissioner reports that the British Columbia apple crop has been marketed, and the quantity is very much below the average. The quality also appears to have been affected by the frosts, and altogether the apple-growers will not have a very substantial balance on the right side this year. Washington apples are found to be of excellent quality, and growers in that section are not asking unduly high prices, with the result that large numbers are being brought across the line, notwithstanding there is a duty of 15 cents per box. The British Columbia fruit inspectors are kept busy keeping out any fruit that is infected with any kind of fruit-pest.

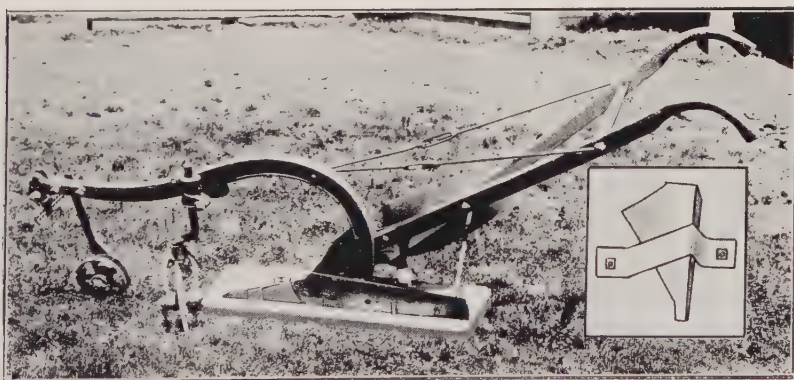
MAKING HUMUS.



Ploughing under peas by a swamp-plough on newly drained swamp ground at Ruakura in order to supply the desired humus. The peas were rolled prior to being ploughed under. The result of the green-manuring should be demonstrated next year, when a similar crop to that grown on the land will be produced on adjoining land of the same character, where peas, instead of being ploughed under, have been utilized for stock-feeding.

SHIFTING A PLOUGH.

A VERY simple arrangement for removing a plough from place to place is in operation at Waerenga Experimental Farm. It merely consists of a 2 in. board a little longer than the total length of the share and mould-board. The illustration will give a good idea of the device. The loop into which the point of the shear is shoved may be made of a piece of hoop steel, iron, or wire. At the rear the sole of the plough is kept in position by two iron pins standing up a couple of inches and arranged at such an angle that a good grip is secured. The benefit of such a board is apparent. It enables a plough to be moved over any class of ground or road without injury, with more comfort to horse and man, and with greater expedition, as it can be thereby kept in an upright position as in the act of ploughing.



THE SIMPLE METHOD ADOPTED AT WAERENGA FOR PROTECTING A PLOUGH WHEN BEING REMOVED.

FRUIT-FLY IN COOK ISLANDS.

INSPECTOR Esam, of this Department, at present quartered in the Cook Group, is making a determined bid to suppress this dreaded pest. The Island Government a while since passed regulations similar to those adopted by Queensland years ago. One of the clauses requires growers to pick up and destroy before noon each day all fallen fruit. Early last month fifteen growers, chiefly Natives, were prosecuted for failing to comply with this regulation. As these were the first cases under the new law, the defendants were convicted, and fined the nominal sum of 1s. each. It is anticipated that this action will have a very beneficial effect.—*T. W. Kirk.*

CO-OPERATIVE EXPERIMENTS.

THE MOVEMENT IN THE SOUTH ISLAND.

FOLLOWING is a list of the co-operative field experiments initiated by the Department in the South Island this season:—

Experimenter.	Nature of Experiment.	Number of Plots.	Total Plots.
Marlborough High School, Blenheim	Silver-beet	1	13
	Chou moellier	1	
	Buda kale	1	
	Millet	4	
	Maize	3	
	Soya beans	1	
	Cow-peas	2	30
Sandos, H., Kaikoura	Mangel, manurial test	7	
	„ variety test	23	12
Mackle, H., Kaikoura	Potato, manurial test	6	
	„ spraying test	6	32
Mackle, B., Kaikoura	Swede, manurial test	8	
	„ variety test	24	35
Coups, J. A., Kaikoura	Turnip, manurial test	8	
	„ variety test	27	4
Evans, Charles, Kaikoura	Lucerne, test	4	
	„	4	5
Todhunter, R. C., "The Peaks," Medbury	Buda kale	1	
Williams, M., Kaiapoi	Silver-beet	1	1
The Canterbury Frozen Meat Com- pany, Belfast	Mangel, variety test	27	100
	Swede,	28	
	Turnip, cultivation test	2	
	Silver-beet	1	
	Buda kale	1	
	Rape, variety test	2	
	Chou moellier	1	
	Thousand-headed kale	1	
	Maize, variety test	3	
	Millet,	4	
	Soya beans	1	
	Carrots, variety test	7	
	Pumpkins,	4	
	Marrow,	5	
	Potato,	4	
	„ spraying test	4	
	Horse-beans	1	
	Kohl rabi, variety test	2	

Experimenter.	Nature of Experiment.	Number of Plots.	Total Plots.
The Canterbury Frozen Meat Company, Belfast	Perennialized Italian rye-grass ..	1	101
	Italian rye-grass ..	1	
	Kudzu vine ..	1	
Davis, William, Amberley ..	Potato, manurial test ..	6	109
	„ spraying test ..	6	
	Mangel, manurial test ..	7	
Davis, William, Amberley ..	„ variety test ..	27	1
	Swede, manurial test ..	8	
	„ variety test ..	28	
O'Halloran, J., Glentui, Bennett's	Turnip „ ..	27	30
	Russian barley (for fodder), comparison with Cape barley ..	1	
	Mangel, manurial test ..	7	
Rountree, E., Marshlands ..	„ variety test ..	23	51
	Te Orangi Home, Burwood ..	17	
	„ „ ..	21	
Slade, F., New Brighton ..	Carrots, „ ..	6	23
	Lucerne, test ..	4	
	Mangel, variety test ..	23	
Curtis, J., Styx ..	Potato, variety test ..	16	32
	Soya bean ..	1	
	Cow-peas, variety test ..	2	
Boys' High School, Rangiora ..	Carrots, „ ..	7	124
	Millet, „ ..	4	
	Chou moellier ..	1	
Newell, Richard, Veitch's Road, Papanui	Buda kale ..	1	4
	Mangel, variety test ..	19	
	Swede, „ ..	23	
Holman, E. F., Winter's Road, Marshlands	Turnip, „ ..	20	3
	Maize, „ ..	3	
	Millet, „ ..	4	
Simpson, Henry, Highstead Road, Papanui	Silver-beet ..	1	1
	Sugar-beet ..	1	
	Cow-peas, variety test ..	2	
Hartnell, E., Woolston ..	Soya beans ..	1	4
	Horse-beans ..	1	
	Carrots, variety test ..	7	
Dunlop, J., Chainey's ..	Kohl rabi ..	1	4
	Peas, variety test ..	10	
	Grasses, clovers, and forage plants ..	24	
	Chou moellier ..	1	4
	Kudzu vine ..	1	
	Choko ..	1	
	Potato ..	4	4
	Millet ..	4	
	Maize ..	3	
	Kudzu vine ..	1	1
	Lucerne, test ..	4	
	„ „ ..	4	

Experimenter.	Nature of Experiment.	Number of Plots.	Total Plots.
Industrial School, Burnham ..	Lucerne, test ..	4	12
	Millet, variety test ..	4	
	Maize, ..	3	
	Chou moellier ..	1	
Mental Hospital, Sunnyside ..	Millet, variety test ..	4	8
	Cow-peas, ..	2	
	Chou moellier ..	1	
	Kudzu vine ..	1	
Mann, John, Templeton ..	Chou moellier ..	1	1
Humphreys, S., Lincoln ..	Millet, variety test ..	4	9
	Maize, ..	3	
	Chou moellier ..	1	
	Buda kale ..	1	
Watson, P., Halswell ..	Mangel, manurial test ..	7	38
	„ variety test ..	27	
	Lucerne, test ..	4	
Osborne, J., Doyleston ..	Wheat, variety test ..	10	10
Hartnell, L., Leeston ..	„ ..	10	10
Rennie, George, Lincoln ..	Mangel, manurial test ..	7	29
	„ variety test ..	22	
Bell, A. J., Weedon's ..	Maize, ..	3	6
	Rape, ..	2	
	Maize and rape (mixed) ..	1	
Skeat, George, Dunsandel ..	Russian barley (for green feed) ..	1	1
Austin, C. H., Sheffield ..	Mangel, variety test ..	22	30
	Maize, ..	3	
	Millet, ..	4	
	Buda kale ..	1	
Baxter, J., Prebbleton ..	Kudzu vine ..	1	1
Gillanders, D., Dartfield ..	Turnip, manurial test ..	8	35
	„ variety test ..	27	
Patten, E. A., Little River ..	Lucerne ..	4	4
Bonifant, J., Wakanui, Ashburton	Wheat, manurial test ..	6	16
	„ variety test ..	10	
Wood, Cecil, Seafield Road, Ashburton	Silver-beet ..	1	5
	Rape, variety test ..	2	
	Buda kale ..	1	
	Thousand-headed kale ..	1	
Pawson, F. F., Anama ..	Mangel, manurial test ..	7	31
	„ variety test ..	20	
	Lucerne, test ..	4	
Stewart, James, Beach Road, Wakanui	Millet, variety test ..	4	4
May and Keig, Messrs., Stavelly ..	Maize, ..	3	7
	Millet, ..	4	

Experimenter.	Nature of Experiment.				Number of Plots.	Total Plots.
Eagglestone, E., Anama ..	Lucerne, test	4	4
Wright, L. D., Winslow ..	" "	4	4
Pritchett, Rev. P., Mount Somers ..	" "	4	4
Smith, J. T., Dorie, Rakaia ..	" "	4	4
Hyde, W., Alford Forest Road, Ashburton	" "	4	4
Robertson, J., Winslow ..	" "	4	4
Maize, M., Pleasant Point ..	Oat, manurial test	5	14
	" variety test	..	..	..	9
King, J., Fairview, Timaru ..	Wheat, manurial test	6	48
	" variety test	..	..	..	8
	Mangel, manurial test	..	..	..	7
	" variety test	..	..	..	27
Hammond, R., Te Moana, Geraldine	Wheat, manurial test	6	46
	" variety test	..	..	..	8
	Swede, manurial test	..	..	..	8
	" variety test	..	..	..	24
Mackenzie, K., Geraldine ..	Oats, manurial test	5	55
	" variety test	..	..	..	10
	Turnip, manurial test	..	..	..	8
	" variety test	..	..	..	27
	Lucerne ..	..	..	..	4
Butler, George, Pleasant Point ..	Silver-beet	1	4
	Lucerne, test	..	..	..	4
Mallison, W. T., Te Moana, Geraldine	" "	4	4
Stewart, W., Waimate ..	Mangel, manurial test	7	60
	" variety test	..	..	..	23
	Millet, "	..	..	..	4
	Buda kale ..	..	..	..	1
	Chou moellier ..	..	..	..	1
	Potato, manurial test	..	..	..	6
	" spraying test	..	..	..	6
	Carrots, variety test	..	..	..	7
	Silver-beet ..	..	..	..	1
	Lucerne, test ..	..	..	..	4
Paul, W. G., Waimate ..	Wheat, manurial test	6	30
	" variety test	..	..	..	10
	Oats, manurial test	..	..	..	5
	" variety test	..	..	..	9
Reynolds, George, Willowbridge ..	Turnip, manurial test	8	62
	" variety test	..	..	..	27
	Swede, "	..	..	..	24
	Maize, "	..	..	..	3
Johnstone, H. B. S., Springbank, Otaio	Lucerne, test	4	4
Hendren, W., Kapua, Arno ..	" "	4	4
Fox, M., Studholme ..	" "	4	4
Gillies, A. C., Belfield Estate, Hakataramea	Mangel, manurial test	7	23
	" variety test	..	..	..	23
	Silver-beet ..	..	..	..	1
	Buda kale ..	..	..	..	1

Experimenter.	Nature of Experiment.	Number of Plots.	Total Plots.
Gillies, A. C., Belfield Estate, Hakataramea	Kohl rabi, variety test	2	34
Special School for Boys, Otekaike	Mangel, manurial test	7	
	" variety test	21	
	Carrots, "	7	
	Buda kale	1	
	Silver-beet	1	
	Chou moellier	1	
	Soya beans	1	
	Cow-peas, variety test	2	
	Maize, "	3	
	Millet, "	4	
O'Neill, E., Otekaike	Potato, manurial test	6	60
	" spraying test	6	
	Mangel, manurial test	7	
	" variety test	15	
	Swede, manurial test	8	
	" variety test	24	
	Turnip, "	27	
	Carrots, "	7	
	Maize, "	3	
	Millet, "	4	
Macpherson, J., Totara Estate, Totaratahi	Buda kale	1	97
	Chou moellier	1	
	Lucerne, test	4	
	Wheat, variety test	8	
	Oat, "	9	
	Mangel "	27	
	Carrot, "	7	
	Maize, "	3	
	Millet, "	4	
	Cow-peas "	2	
Taylor, J. B., Kokoamo	Buda kale	1	73
	Silver-beet	1	
	Chou moellier	1	
	Soya beans	1	
	<i>Phalaris commutata</i> (seed and roots) ..	2	
	Rhodes grass	1	
	Russian barley	1	
	Kudzu vine	1	
	Turnip, manurial test	8	
	" variety test	27	
Copeland, A. H., Ardgowan	Swede, "	28	67
	Buda kale	1	
	Silver-beet	1	
	Rape, variety test	2	
	Mangel, manurial test	7	
	" variety test	27	
	Potato, "	6	
	" spraying test	6	
	Swede, manurial test	8	
	" variety test	28	
	Maize, "	3	95
	Millet, "	4	
	Chou moellier	1	
	Buda kale	1	
	Lucerne, test	4	

Experimenter.	Nature of Experiment.	Number of Plots.	Total Plots.
Mahoney, J. Whitstone ..	Lucerne, test ..	4	111
	Mangel, manurial test ..	6	
	.. variety test ..	27	
	Swede, manurial test ..	8	
	.. variety test ..	28	
	Turnip, ..	27	
	Maize, ..	3	
	Millet, ..	4	
	Buda kale ..	1	
	Thousand-headed kale ..	1	
	Chou moellier ..	1	
	Silver-beet ..	1	
Ross, Angus, Herbert ..	Lucerne, test ..	4	125
	Oat, manurial test ..	5	
	.. variety test ..	9	
	Mangel, manurial test ..	7	
	.. variety test ..	27	
	Swede, manurial test ..	8	
	.. variety test ..	28	
	Turnip, ..	27	
	Maize, ..	3	
	Millet, ..	4	
	Silver-beet ..	1	
Waitaki Boys High School, Oamaru ..	Buda kale ..	1	195
	Chou moellier ..	1	
	Lucerne, test ..	4	
	Mangel, manurial test ..	7	
	.. variety test ..	25	
	Turnip, manurial test ..	8	
	.. variety test ..	27	
	Swede, manurial test ..	8	
	.. variety test ..	22	
	Potato, manurial test ..	6	
	.. spraying test ..	6	
	Maize, variety test ..	3	
	Millet, ..	4	
	Rape, ..	2	
	Silver-beet ..	1	
	Thousand-headed kale ..	1	
	Soya beans ..	1	
	Buckwheat ..	1	
	Cape barley ..	1	
Martin Bros., Enfield ..	Russian barley ..	1	4
	Kudzu vine ..	1	
	Grasses, clovers, and forage plants ..	64	
	..	4	
Newland, George, Incholme, Maheno ..	Lucerne, test ..	4	4
Rowland, J. F., Enfield	4	4
Finlay, D., Windsor	4	4
Taylor, S. M., Oamaru	4	4
Gillies, A., Hampden ..	Mangel, manurial test ..	7	27
	.. variety test ..	27	
	Swede, manurial test ..	8	
	.. variety test ..	28	
	Turnip, ..	27	

Experimenter.	Nature of Experiment.				Number of Plots.	Total Plots.
Gillies, A., Hampden	Silver-beet	1	101
	Buda kale .. ..	..	..	..	1
	Grass mixture .. ..	..	..	..	1
	Chou moellier .. ..	..	..	..	1
Dalglish, Matthew, Palmerston ..	Lucerne	4	75
	Mangel, manurial test .. ..	..	..	..	7
	.. variety test .. ..	..	..	..	27
	Turnip, manurial test .. ..	..	..	..	8
	.. variety test .. ..	..	..	..	27
	Chou moellier .. ..	..	..	..	1
Murray, Andrew, Dunback	Buda kale	1	35
	Turnip, manurial test .. ..	..	..	..	8
McLennan, A., Dunback variety test	27	31
	Lucerne, test .. ..	..	..	..	4
Kelcher, F. C., Waianakarua ..	Swede, variety test	27	1
	Silver-beet .. ..	..	..	..	1
Mount Royal Estate, Palmerston	Lucerne, test	4	119
	Mangel, variety test .. ..	..	..	..	27
	Swede, .. ..	..	..	..	28
	Turnip, .. ..	..	..	..	27
	Oat, .. ..	..	..	..	9
	Maize, .. ..	..	..	..	3
	Millet, .. ..	..	..	..	4
	Pumpkin, .. ..	..	..	..	3
	Silver-beet .. ..	..	..	..	1
	Sugar-beet .. ..	..	..	..	1
	Buda kale .. ..	..	..	..	1
	Thousand-headed kale .. ..	..	..	..	1
	Chou moellier .. ..	..	..	..	1
	Sugar-corn .. ..	..	..	..	1
	Kudzu vine .. ..	..	..	..	1
	Carrot, varetly test .. ..	..	..	..	7
Aubrey, W., Palmerston	Swede, manurial test	8	8
Curle, T. B., Waikouaiti	Lucerne, test .. ..	..	..	..	4
McKenzie, Robert, Palmerston ..	.. .. ..	..	..	..	4
The New Zealand and Australian Land Company, Hampden	.. .. ..	..	..	..	4
Gourley, W., Anderson's Bay Road, Dunedin	4	14
	Mangel, variety test .. ..	..	..	..	10
Lyden, Alfred, Waitati manurial test	7	29
	.. variety test .. ..	..	..	..	22
Hyslop, John, Waitati	Turnip, manurial test	8	35
	.. variety test .. ..	..	..	..	27
King, Charles, Hayward Point, Pu- rakanui	Lucerne, test	4	35
Forsyth, Charles, Table Hill, <i>via</i> Milton	Turnip, manurial test .. ..	..	..	..	8
Clark, David, Moneymore, Milton variety test	27	35
	.. manurial test .. ..	..	..	..	8
	.. variety test	27	35

Experimenter.	Nature of Experiment.				Number of Plots.	Total Plots.
Clark, Jasper, Lovell's Flat ..	Turnip, manurial test	8	35
	„ variety test .. ..	..	..	..	27
Brown, W. C., Mosgiel ..	Soya beans	1	4
	Maize, variety test .. ..	..	..	..	3
Dowd, J., Dowfields, Outram ..	Lucerne, test	4	4
Adam, W. T., Otokia, Taieri ..	„ „	4	4
Houliston, Adam, Kakapuaka ..	Mangel, variety test	27	98
	Swede, manurial test .. ..	..	..	..	3
	„ variety test .. ..	..	..	..	28
	Turnip, manurial test .. ..	..	..	..	8
	„ variety test .. ..	..	..	..	27
Mosley, Joseph, Inch Clutha, Sterling	Swede, manurial test	8	71
	„ variety test .. ..	..	..	..	28
	Turnip, manurial test .. ..	..	..	..	8
	„ variety test .. ..	..	..	..	27
Smith, Joseph, Sterling ..	Mangel, „	27	55
	Swede, „ .. ..	..	..	..	28
Anderson, J. C., Sterling ..	Lucerne, test	4	71
	Mangel, variety test .. ..	..	..	..	27
	Swede, „ .. ..	..	..	..	24
	Carrot, „ .. ..	..	..	..	7
	Millet, „ .. ..	..	..	..	4
	Cow-peas „ .. ..	..	..	..	2
	Silver-beet .. ..	..	..	..	1
	Sugar-beet .. ..	..	..	..	1
	Soya beans .. ..	..	..	..	1
Lowery, Thomas Chrichton, Milton	Swede, manurial test	8	67
	„ variety test .. ..	..	..	..	24
	Turnip, manurial test .. ..	..	..	..	8
	„ variety test .. ..	..	..	..	27
Boyd, Peter, Lovell's Flat ..	Mangel, variety test	27	27
Snushall, H., Clydevale ..	Wheat, manurial test	6	62
	„ variety test .. ..	..	..	..	5
	Oat, manurial test .. ..	..	..	..	5
	„ variety test .. ..	..	..	..	9
	Swede, manurial test .. ..	..	..	..	8
	„ variety test .. ..	..	..	..	28
	Silver-beet .. ..	..	..	..	1
Overton, C. F., Clydevale ..	Turnip, manurial test	8	41
	„ variety test .. ..	..	..	..	27
	Silver-beet .. ..	..	..	..	1
	Mixed grasses .. ..	..	..	..	1
	Top-dressing	4	1
Gilroy, G. H., Sterling ..	Soya beans .. ..	..	..	..	1
Griffiths, Matthew, Papatowai ..	Lucerne	4	4
Ford, J., Owaka ..	„	4	4
McKay, J., Tuapeka West ..	„	4	4

Experimenter.	Nature of Experiment.				Number of Plots.	Total Plots.
Gent, J., Lynn Farm, Greenfield ..	Wheat, manurial test	5	24
	„ variety test	..	..	..	5
	Oats, manurial test	..	..	..	5
	„ variety test	..	..	..	9
Pitt, H. E., Punt Farm, Greenfield	Wheat, manurial test	5	25
	„ variety test	..	..	..	6
	Oats, manurial test	..	..	..	5
	„ variety test	..	..	..	9
Smith, James, Awatea, Waitahuna West	Turnip, manurial test	8	73
	„ variety test	..	..	..	27
	Swede, manurial test	..	..	..	8
	„ variety test	..	..	..	28
Hyslop, J., Waterside, Greenfield	Rape, „	2	35
	Turnip, manurial test	..	..	..	8
	„ variety test	..	..	..	27
	„ „	..	..	..	27
Hadfield, Cecil, Greenfield ..	„ manurial test	8	70
	„ variety test	..	..	..	27
	Swede, manurial test	..	..	..	8
	„ variety test	..	..	..	27
Baxter, T. N., Clyde ..	Lucerne, test	4	13
	Carrot ..	..	..	..	7
	Chou moellier	..	..	..	1
	Buda kale	..	..	..	1
Bradley, F., Cromwell ..	Lucerne, test	4	19
	Maize, variety test	..	..	..	3
	Millet, „	..	..	..	4
	Cow-peas „	..	..	..	2
	Chou moellier	..	..	..	1
	Buda kale	..	..	..	1
	Silver-beet	..	..	..	1
	Soya beans	..	..	..	1
	Horse-beans	..	..	..	1
Faisandier, J., Clyde ..	Rhodes grass	1	4
	Lucerne, test	..	..	..	4
Riley, F. R., Timaru Creek Station, Lake Hawea	„ „	4	4
	„ „	..	..	..	4
Scott, W., Sutton ..	„ „	4	52
	Mangel, variety test	..	..	..	22
	Swede, „	..	..	..	24
	Buda kale	..	..	..	1
	Chou moellier	..	..	..	1
Prendergast, M., Hyde ..	Lucerne	4	4
	Wheat, variety test	..	..	..	10
Cullen, W., Crookston, Heriot ..	Turnip, manurial test	8	10
	„ variety test	..	..	..	27
	Swede, „	..	..	..	24
Potts, R., Crookston, Heriot ..	Turnip, manurial test	8	59
	„ variety test	..	..	..	27
	Swede, „	..	..	..	27
McAuley, A., Tapanui ..	Turnip, manurial test	8	62
	„ variety test	..	..	..	27
	Swede, „	..	..	..	27
Rodger, D., Tapanui ..	Turnip, manurial test	8	

Experimenter.	Nature of Experiment.	Number of Plots.	Total Plots.
Rodger, D., Tapanui	Turnip, variety test	27	35
McKenzie, E., Pomahaka ..	.. manurial test	8
	.. variety test	27	
	Swede,	24	59
Crump, J., Rankleburn, Pomahaka	Turnip, manurial test	8	
	.. variety test	27	
McIntyre, A., Kelso manurial test	8	35
	.. variety test	27	
Kinnaston, R., Roxborough, Edievale	.. manurial test	8	35
	.. variety test	27	
Love, G., Moa Flat, Edievale manurial test	8	59
	.. variety test	27	
	Swede,	24	
Ferguson, A., Kelso	Turnip, manurial test	8	35
	.. .. .. ..	27
Pirie, James, Woodlands ..	Lucerne, test	4	14
	Maize, variety test	3	
	Millet,	4	
	Thousand-headed kale	1	
	Buda kale	1	
	Chou moellier	1	
Kerr, J. B., Winton	Maize, variety test	3	8
	Millet,	4	
	Chou moellier	1	
Clark, Walter, Woodlands ..	Turnip, variety test	27	59
	Swede, manurial test	8	
	.. variety test	24	
Gould, Henry, Otautau	Buda kale	1	1
King, Duncan, The Bend, Winton	1	1
Campbell, A., Fernbrook, Ridge, Wyndham	Lucerne, test	4	4
Riley, James, Orepuki	4	4
Barwell, J. F., Tuatapere	4	4
Dickie, Matthew, Mataura	4	4
Jennings, W., Awaru	4	4
Macdonald and Hunt, Mossburn	4	4
Wilson, J. T., Fairlie	4	12
	Maize, variety test	3	
	Millet,	4	
	Buda kale	1	
Goodwin, J. E., Fairlie	Silver-beet	1	1
Geddings, W. G., Fairlie ..	Turnip, manurial test	8	59
	.. variety test	27	
	Swede,	24	
Pilkington, C., Fairlie	Mangel, manurial test	7	11
	Lucerne, test	4	

Experimenter.	Nature of Experiment.			Number of Plots.	Total Plots.
Adamson, W., Fairlie	Maize, variety test			3	3
Wheeler, A. H., Roto Manu ..	Lucerne			4	
	Mangel, manurial test			7	
	„ variety test			27	
	Swede, manurial test			8	
	„ variety test			26	
	Carrot, „			7	
	Chou moellier			1	
Houlston, R., Kokatahi	Kudzu vine			1	
	Mangel, manurial test			7	
	„ variety test			27	
	Carrot, „			7	
	Lucerne, test			4	
Baty, J., Coal Creek, Greymouth ..				—	81
	Mangel, manurial test			7	
	„ variety test			23	
	Turnip, manurial test			8	
	„ variety test			27	
	Carrot, „			7	
Howard, F., Arthurston, Hokitika ..	Lucerne, test			4	
				—	45
	Mangel, manurial test			7	
McIntosh, J. W., Hokitika	„ variety test			22	
				—	76
Meara, M., Totara Flat, Greymouth	„ manurial test			7	
	„ variety test			16	
Empson, C. C., Hokitika				—	29
	Rhodes grass			1	
	Buda kale			1	
Caldwell, J. W., Cameron, Grey-mouth	Chou moellier			1	
				—	3
	Chicory			1	
Westland A. and P. Association, Hokitika	Sheep's burnet			1	
				—	2
Morgan, W. P., Hokitika	Grasses			2	
				—	2
	„			2	
Patterson, J., Hokitika	Buda kale			1	
	Chou moellier			1	
				—	4
Chapman, A. H., Kurow	Lucerne			1	
				4	
	Mangel, manurial test			7	
	„ variety test			27	
	Buda kale			1	
	Silver-beet			1	
	Chou moellier			1	
	Russian barley			1	
McAuley, W., Incholme, Maheno ..	Grass mixture			1	
	<i>Phalaris commutata</i>			1	
Robertson, L. D., Highcliff, Otago Peninsula				—	40
	Buda kale			1	
Hellyer, F., N.E. Harbour, Dunedin	„			1	
				—	1
Pyre, T., Anderson's Bay, Dunedin	„			1	
Cadegow, J., Anderson's Bay, Dunedin	„			1	
Morris, Thomas, Pukihiki, Otago	„			1	

Experimenter.	Nature of Experiment.				Number of Plots.	Total Plots.
Black, J., Broad Bay, Otago ..	Buda kale	..	..	..	1	1
Driver, Charles, Heyward's Point, Otago	"	..	..	..	1	1
Ford, A., Heyward's Point, Otago	"	..	..	..	1	1
Foote, J., Purakanui ..	"	..	..	..	1	1
Lyden, A., Waitati ..	"	..	..	..	1	1
Thurlow, J. W., Warrington ..	"	..	..	..	1	1
Manson, A., Bayswater, Otago ..	"	..	..	..	1	1
Simpson, G., West Plains ..	"	..	..	..	1	1

REVEGETATING DEPLETED COUNTRY, MACKENZIE PLAINS AND CENTRAL OTAGO.

	Number of Plots.
Sawdon Run, Mackenzie country ..	43
Haldon Run, " ..	43
Earnscleugh Run, Central Otago ..	43
	129

GRASSING HILLY COUNTRY, WEST COAST.

	Number of Plots.
Marks's Farm, Blue Spur Road, Hokitika ..	21
Establishing heath on pakihi country, West Coast—1 plot.	

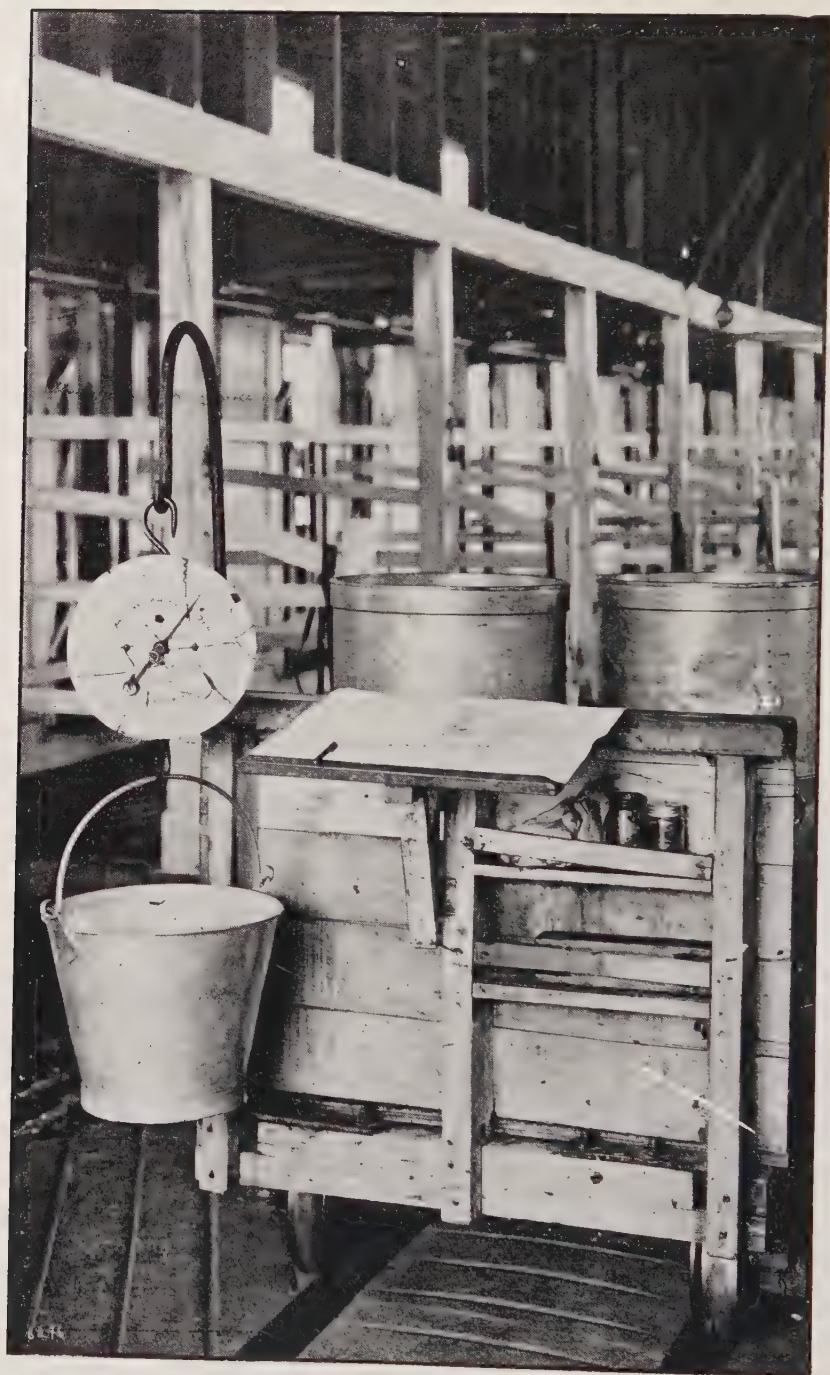
WEST CANADIAN MARKETS.

WRITING on the 28th of November the Trade Representative at Vancouver reports as follows :—

"At the time of writing butter prices are firm at an average of 4 cents per pound higher than a year ago. Considering that stocks are considerably lighter than at this time last year, the present prices are not thought to be too high on the basis of supply and demand. All Western creameries with one or two exceptions have closed down for the winter. The first shipment of New Zealand creamery ex "Marama" is of very fine quality, and has found a ready market. Both New Zealand and Australian creameries are very lightly salted, and some buyers complain on this account. So long as the butter proves to be of good-keeping quality after being in cold storage and retains its full grass flavour it will be a good seller. Eastern Canadian butters are heavier salted, containing about 1 oz. to 1¼ oz. to the pound.

"Stocks of cheese are light, and receipts are much less than at this time last year, with consequent high prices, though business is not active, and there is only a moderate amount of goods being turned over. Finest Canadian are worth 13¾ cents to 14½ cents f.o.b. factory.

"Prices of both hams and bacon are lower than at the corresponding period of last year, being about 18 cents for ham and 19 cents for bacon. The quality of the produce is excellent, there being a full supply available of light-weight averages for both hams and bacon which this market demands. One or two New Zealand shippers have tried to introduce New Zealand bacon on this market, but with little success. The fault is not due to the quality of the meats so much as the cut. Shippers desiring to enter Canadian and American markets must conform to the standard cut of hams and bacon. If this change is made the quality of the New Zealand product would commend itself."



APPARATUS FOR WEIGHING AND RECORDING THE MILK-YIELD OF THE INDIVIDUAL COWS OF THE DAIRY HERD AT THE WERAROA EXPERIMENTAL FARM.

THE HEMP INDUSTRY.

W. H. FERRIS.

THE boisterous weather of December affected to a considerable extent the quality of the hemp produced in the Wellington Province, colour and strength being much weaker as a result of the inability to properly bleach the fibre, a defect emphasized by the holidays interfering with the work of paddocking.

WEAK STRIPPING.

Much of the fibre reaching the Foxton grading-store during the past two months has exhibited weak stripping. The fibre had been milled from a good class of leaf, but the careless stripping has reduced the quality of the resulting fibre by a full grade. Many stripper-keepers allow their strippers to run too long before tuning them up again—that is, allowing the beating-bars to become too much worn in the centre—negligence which means a fair proportion of inferior fibre and a general irregularity in quality. Even where the neglect to maintain the beating-bars at an even face does not result in reducing the fibre to a lower grade it has the effect of destroying that uniformity which is such an important market consideration. In one case that has come under my notice the stripping was of such a rough nature that the miller had to employ a man to sort the hemp over the bar. If the stripping had been more carefully done the cost of the extra labour would have been saved, and the hemp would probably have presented a better average appearance.

DISEASED LEAF.

The proportion of diseased leaf in the Manawatu swamps is much less than it was last season, when the prevalence of affected leaf was so great that the market value of a large proportion of the hemp milled in that district was seriously reduced. The climatic conditions of this season have probably been responsible for the improved condition of the leaf.

STRIPPER-SLIPS.

The warning issued in the December number of the *Journal* as to the necessity of exhibiting care in baling stripper-slips for export has not had the desired effect in several instances. In these cases the slips had been baled in a wet, black, and rotten condition, carelessness which has

necessitated condemnation of the parcel. In other instances the condition of the slips has not been so serious, but still it has been too unsatisfactory to warrant the parcels being approved for export. I would again remind millers that the trade in this by-product was formerly killed by the shipment of rubbish. Notwithstanding this experience, millers have sent forward recently slips of such a poor character that had they been allowed to be shipped they would have killed at the outset the trade now being revived. Some millers have realized the necessity of shipping the slips in decent condition: their parcels have been passed for export.

UNSATISFACTORY SCUTCHING.

Where defective scutching has been found it has invariably been in the tails of the hanks; when, combined with poor stripping, at this point it has constituted a serious weakness, especially when the tails have not been cut off in the field. Recently poor scutching has been disclosed in the body of the hanks. Not only has the rubbish not been removed at this point, but the failure to properly tease the material has caused it to become subsequently matted. This often means having to reduce an otherwise good parcel of hemp by a full grade. The trouble is not always caused by careless workmanship, but is sometimes the result of the drum of the scutcher not being of the required diameter, or the scutcher not being in good order. Evidently some millers fail to realize that the scutcher-drum requires periodical attention in order that it may be able to do effective work.

A GOOD STANDARD.

Notwithstanding the above defects, the majority of millers are working to a high standard of quality. Good-fair contracts are general, but owing to the recent bad bleaching weather only low-pointed parcels have been possible, while in a good many cases during the past two months the grade was missed. At Foxton, where flood-waters have combined with the rough weather to counteract good work in the mill, the percentage of good-fair parcels has been very low. With improved weather, however, the quality of the hemp should reach a higher average standard this year than it has in any past season.

PROSPECTS.

With the improved value on oversea markets millers in districts where profitable production up to the present has not been possible (owing to local conditions, &c.) are now talking of starting their mills. At least, this is the position reported from the Auckland, Marlborough, and Southland districts.

Latest Home advices indicate that good values should rule for some time, owing to Americans being in the field for phormium for binder-twine purposes.

THE APIARY.

NOTES FOR MARCH.

F. A. JACOBSEN.

REQUEENING.

THE advisability of autumn requeening is a subject that requires a great amount of attention, and in these days, when the science of beekeeping is under discussion, the smallest matter is not too small for consideration. The oldest apiarists are not afraid of admitting the fact that they have a great deal yet to learn, and queen-rearing covers a great field for experimenting. It is not, however, on queen-rearing that I wish to speak, but on requeening. Formerly beekeepers were in the habit of rearing their young stock of queens in the early spring, when they had to force colonies to rear drones for mating purposes; now drones in a hive have a tendency to induce a colony to swarm, consequently drone-rearing in the spring should be suppressed as much as possible by honey-producers. Another factor against spring requeening is the loss of time when time is most valuable. A well-known apiarist in a large way tested out last season to ascertain which was the better plan. One yard he requeened with Italian young stock in the autumn, and the other with the same kind of stock in the spring, and he assured me that the former apiary produced nearly twice as much extracted honey in the same district as the latter; and he is now thoroughly convinced that the autumn is the proper time to introduce young queens. They may be reared and mated at any time through the summer when it is most convenient, and kept in nuclei until required. In this way, not being rushed and anxious for early introducing, as in the spring, you have plenty of time to test for purity of mating.

It may be asked, why do beekeepers follow a system of requeening at all? Why not let the bees supersede their old queens? The answer is quite simple, and there are many reasons why a young queen should always reign in a hive. A few of the foremost are as follows: An old queen fails after the second year to lay sufficient eggs to keep up the strength and popularity of the hive. Old queens are always more prone to swarming than young ones, and to ensure a good honey crop swarming must be kept in check as much as possible. When a colony swarms the old queen goes with the swarm, and the old hive is left queenless for a few days until the young queen emerges from her cell. Seven or eight

more days must elapse before she is mated and egg-laying commences, so it will be noted that a big loss of time in breeding is occasioned when a colony swarms and is, too frequently, divided into two and very often half a dozen portions through young queens emerging and going off with a fresh contingent of bees. If this is allowed the old hive will become so weak that no surplus honey will be produced, and even feeding may have to be resorted to to keep them through the winter. These young queens are often mismated, and if supplies of pure Italian stock are not kept on hand in nuclei to replace those mismated the apiary will gradually go back to a black strain. These reasons, I hope, are sufficient to induce every apiarist to take up a system of requeening and so improve his stock and banking account.

In summing up, it will be seen that autumn requeening has many advantages and allows more time to be devoted to the building-up of any weak stock in the spring and giving the apiary more attention generally.

BLACKS AND ITALIANS.

Of all the different varieties of bees only two stand out prominently as being most suitable for our requirements. The remaining varieties are either excessive swarmers or very poor honey-gatherers, and no great amount of attention has been exhibited in their direction. The two kinds that are most popular are Italian (leather-coloured and golden) and blacks (German). Of late years Italian bees have steadily advanced to the front, and now hold favour with all the keen beekeepers of the world. The steady demand for Italian stock is due to the fact that they have proved themselves better honey-gatherers than other races, and also better disease-resisters. Of the two varieties of Italians the leather-coloured are preferable, for two reasons: firstly, they are a hardier bee; and, secondly, they withstand foul-brood (*Bacillus larvæ*) much better than the golden Italians or blacks. In New Zealand the best thing that can be done is to Italianize your apiary at once and so check disease before its gets a firm hold, and I am sure that if this were done hundreds of pounds could be saved every year. Let it be understood that about 15 per cent. at a rough guess of all the colonies in the Dominion have to be treated every year for disease, and every treatment costs from 2s. to 3s. per hive. I do not maintain that if every apiary were Italianized foul-brood would be wiped out, but what I do say is that the number of colonies so affected could every year be very greatly reduced. I believe a time will come when no one will buy any honey from an apiary known to contain foul-broody colonies, and with this probability in mind it is the duty of every beekeeper, and to his advantage, to breed a bee that has proved itself the most strenuous resister of the ravages of this most dreaded disease. During my visits to apiaries in various parts

of the Dominion I have noticed a very much larger percentage of black bees diseased than Italians. The reason for this is not clear; but, nevertheless, the fact remains, and is deserving of the closest attention.

A few remarks here on the first cross between a black and Italian bee will not be out of place. An Italian queen mated to a black drone will always produce a pure Italian drone; and a black queen mated to an Italian drone will always produce a black drone. This may seem very contradictory, but a study of the anatomical structure of the queen and perusal of the best authorities will soon convince my readers of the truth of this statement. It is not necessary, therefore, in order to get pure drones during the queen-breeding season that the queen selected should be purely mated. Halfbred or hybrid bees of the first cross are, as a rule, vicious and not to be trusted, but for honey-gathering qualities they often surpass even a purebred colony. The second and third cross on the black side are not recommended.

CALIFORNIAN THISTLE ATTACKED BY RUST.

A NUMBER of specimens of Californian thistle attacked with rust have been received by the Fields and Experimental Division of the Department. The Biologist, Mr. A. H. Cockayne, reports the trouble to be the thistle-rust (*Puccinia hieracei*). He says: "This disease appears to be spreading considerably in various localities, and experiments have been undertaken to ascertain its value as a thistle-controller. So far it appears to attack only isolated plants, and rarely appears to kill them entirely out. However, it has certainly increased considerably during the past two seasons, and there are indications that it may prove of distinct value.

Australian fruitgrowers are moving in the direction of asking the Commonwealth Government to subsidize the shipping companies which are willing to provide cool storage for the Australian - New Zealand trade. They complain badly that they cannot get their New Zealand shipments carried in cool storage. This is a move in the right direction.—*T. W. Kirk.*

A cold-storage company has been established in Sweden, the operations of which it is intended to extend throughout the country, for the purpose of preserving the large supply of fruit hitherto wasted or destroyed, to enable native fish to be stored when the supply is plentiful, and generally to steady the market prices of perishable products.—*Bulletin of International Institute of Agriculture.*

ORCHARD WORK FOR MARCH.

W. A. BOUCHER.

COVER CROPS FOR ORCHARDS.

IN dealing with the working of orchard land, clean cultivation during the spring and summer months has been recommended. Most growers admit the value of clean cultivation, yet it must be considered that to continue this for a series of years will eventually tend to deprive the land of humus. In the case of clay lands especially, absence of humus permits the running together of the soil, creating increased difficulty in cultivation, and producing a condition that is detrimental to the future prospects of the orchard. In some districts and soils autumn and winter growth is so rapid that if the land be left unworked the natural growth will be sufficiently luxuriant by the time the spring ploughing is due to provide the necessary humus. In other localities and soils where the conditions are less favourable it will be found necessary perhaps once in three or four years to sow some quickly growing crop with a view to turning it under with the plough in the spring. If such a crop be planted too late, when the warmth has left the soil, development will be so slow that when spring arrives the growth will be insufficient to prove of much value when turned under. It is therefore advisable to sow early in order to secure such a crop that when ploughed it will add sufficient humus to keep the soil open and friable and compensate for the cost of seed and labour.

CODLIN-MOTH.

Up to the present time the climatic conditions this season almost generally throughout the Dominion have proved more variable and unseasonable than those experienced for several years. In many districts the season has proved somewhat late for some classes of fruits, so that it is more than probable that such a pest as codlin-moth will be on the wing in fair numbers during the early part of March, especially in the warmer districts of the Dominion. It would be advisable, therefore, for growers to keep this pest under observation, and, if necessary, to protect their crops of late varieties of apples and pears from infection, for it has been noticed that when the early part of the season has been cold and unseasonable infection may continue for a longer period than under normal conditions.

LEECH.

As several instances of neglect to make the necessary steps to control this pest have come under notice lately, it may be as well to remind

growers that attack by leech if left unchecked causes such serious leaf-injury as to be practically equivalent to defoliation. Deprived of healthy leaf-action the trees suffer from stagnation in growth, and the buds from starvation. No effort should be spared to keep this pest well under control.

PACKING.

During the month of March growers will be fully occupied in gathering, packing, and marketing their crops of fruit. Of late years there has been marked progress in grading and packing, but many instances still come under notice where the handling in gathering, grading, and packing still show room for considerable improvement. Those who visit the fruit-markets from time to time cannot fail to notice many lines of what has evidently been good fruit when gathered depreciated in value by half or even more through rough handling, poor grading, and bad packing. In view of an export trade in apples and pears, which must certainly eventuate, growers should devote the strictest attention to grading and packing, for it will be found that proficiency in this can only be attained by considerable practical experience. An article on apple-packing by George Stratford appeared in the January issue of the *Journal*.

ORANGES IN GOLDEN BAY.

THERE are localities in the Nelson Provincial District where citrus fruits will grow well. Some years ago I obtained from Mr. Adderley Willcocks, of Rocklands, Motupipi, a box of lemons which, when properly cured here, obtained the highest praise from all who saw them. On a recent visit the pleasure was afforded me of examining Mr. Willcocks's small experimental citrus orchard. He has several varieties all doing well, amongst them being Paramatta, Poor Man, Navel. The snapshot shows that the trees are thriving, and suggests that more attention to citrus fruit in that locality would be very desirable. — T. W. Kirk.



THE FARM GARDEN.

W. H. TAYLOR.

PLANTING in general will now cease for a time. Plants of the cabbage family should be established before now. It would be useless to plant at present, except it may be cabbages; and even this would prove useless unless they are well forward—their planting having been delayed for some reason. In any case, there must be no further delay. Sowing may include turnips—still in a small area—silver-beet, lettuce, radish, and spinach.

Spinach now requires very different treatment to that which was proper during the summer months. During summer spinach is a very evanescent crop. It stands but a short time before going to seed, and nothing can prevent it doing so. Pinching off the tops simply strengthens the side flowering-stems, so that to maintain a summer supply it must be sown several times. In winter-time, however, its behaviour is different. It never runs to seed till spring, and if the soil is good and the plants are thinned to about 9 in. or 10 in. apart it will give fine leaves all the winter. In this respect the private gardener has a great advantage over the grower for market. It is impossible to make up the leaves in bunches for sale; consequently the plants are drawn whole, being left closer together for that purpose. They therefore never produce the fine leaves and succulent quality of home-grown spinach. There are two varieties of spinach as well as New Zealand spinach, which need not be considered. There is the round-seeded or summer variety, and the prickly-seeded or winter. The former gives the largest leaves, and, though termed summer spinach, is sufficiently hardy for winter use in all the temperate parts of the Dominion. The seed should be in the ground by the last week in February.

Leeks may still be planted, but those put out now must not be expected to be ready for use till September and October. They will, indeed, make but little growth till that time, but will, with the advent of spring, make a sudden and surprising growth. They will prove very valuable during those difficult months. An economical method of planting leeks has been described. It will bear repeating, as it presents a great saving of ground space and labour as against the old plan. First draw broad drills, as though for peas, using the flat edge of the hoe; drills to be about 15 in. apart. The plants should be a good size. With a

dibber make a hole its full depth, working it round with a circular movement to enlarge it and make the sides stand. Insert a plant, so that the roots go right to the bottom of the hole. This doubles the roots up. Lift the plant enough to straighten the roots, and fill the hole in firmly, not by pushing loose soil into it, but by inserting the dibber again into the soil a couple of inches away and bringing the handle over the plant with a levering movement. This closes the hole, breaks down the stiff sides of it, and makes the plant firm. Plants that were put out in this way some time ago will by now have made some growth, and usually the soil will have become weedy. Here another advantage of the system will become apparent. With a draw-hoe bring into the drills the soil previously drawn out. This will in one stroke loosen the weeds between the drills, and cover up those between the plants.

Celery may be earthed up for blanching when sufficient growth has been made. Be sure not to mould up while the soil at the roots is very dry, or it will remain so to the detriment of the celery, which would be likely to prove pithy. It is not advisable to mould up until the plants are large enough for use, as except under the best of conditions, the plants grow poorly after moulding, because water does not reach the roots readily when the banks are thrown up. It is true it is a common practice in some places to mould by degrees. Particularly is this so in England, but it should be remembered that vegetable gardens there are trenched nearly 3 ft. deep, and quantities of manure put into the very bottom, whereas in this country we have often to do our best with cultivation one spit deep.

The soil between broccoli, cabbages, and such plants should be frequently stirred, not only to keep weeds in check, but also, and more particularly, to conserve moisture. This process has an astonishing effect on the growth of the plants, and is of great assistance in combating diamond-back moth, the so-called cabbage-fly.

Tomato-plants should not be allowed to waste strength in useless growth. The cold season has kept them back, consequently every effort should now be made for the production of fruit. All the side shoots or lateral growths that appear on the bearing-stems should be nipped out as soon as seen. The foliage on the bearing-stems should be retained. The leaves are the lungs of the plant. It is not necessary to have the sun shining on the fruit; it is no help whatever towards ripening; possibly it is even the reverse. I have always found that the first ripe fruits are underneath leaves, quite out of the sun.

FURTHER OBSERVATIONS ON PEA TRIALS, ETC.

Carter's Springtide, Daybreak, and English Wonder, sown on 8th July, came into use on 17th November, the supply lasting till 29th

December. The wet spring no doubt prolonged their period of production beyond the normal.

Carter's Springtide, Sherwood, and Sutton's Dwarf Defiance, sown on 15th August. Springtide was first gathered on 1st December, and lasted three weeks. Sherwood was ready for use on 11th December. It has been kept for seed. Dwarf Defiance was first gathered on 23rd December, and the last on 13th January.

Cauliflower.—Early Erfurt, sown on 10th April, 1911. It was first cut on 9th December, and is still in use.

Italian agriculture spends, at the present day, over 100 millions of francs (franc = 10d.) in chemical manures.

By making use of a special medium advised by Lohms Mr. R. Grein-Smith has found, according to *Nature*, as many as three millions of nitrogen-fixing Rhizobia (germs) in one gram of agricultural soil.

The field force of the United States Geological Survey is searching for deposits of minerals which shall furnish the three necessary elements contained in a complete fertilizer—namely, phosphate rock, nitrate salts, and potash salts.

A motor has been designed by a German engineer, Mr. K. von Meyenburg, which, in connection with a revolving cylinder, serves as a machine for cultivating the ground. The cylinder is attached behind the motor, and when set in motion it ploughs up the soil by means of the elastic teeth made of round steel wire with which it is provided.—*Bulletin of the International Institute of Agriculture*.



THE POULTRY INDUSTRY.

F. C. BROWN.

Now is the time to note the late moulters, and thereby be possessed of a good guide to the best birds to breed from. The early moulters will be now taking their natural rest, and those that are second-year birds should be marketed at once. Close observation is imperative to discover the long-season layers—that is, to be able to accurately select the pick of the late moulters. Having separated the most desirable breeding-birds, it is not wise to force their production and get everything that is possible out of them, but rather they should be checked in their production if necessary, and be given a free range under good conditions: this in order that they may come to the breeding season with as much vigour as possible, necessary for the production of healthy stock. It is wise in this connection to pay strict attention to constitution. However well a fowl may lay, if she does not possess the desired constitutional points she should not be bred from. The breeder should always be an active bird; never of a sluggish temperament. Again, while egg-laying power may be the main objective, the matter of type should not be overlooked. While the great weakness in crossbreeding is the inability to transmit desirable characters through subsequent generations, so to a lesser degree in mating birds of divergent types in the one breed the advancement towards an ideal is much more difficult than where both the male and female are built on the same lines. Given sound constitution, rather narrow inbreeding is the best means of establishing and advancing a desired character.

THE PULLETS.

There should be no delay now in getting the pullets into their permanent quarters; but this should not be done until the houses are properly prepared for them. To have the young birds well settled down before they commence to lay is not only a prevention of their going into a moult with the adult birds but is the best means of making sure of securing eggs in the dear season. It is surprising the disappointments there are in obtaining winter eggs from pullets bred to lay for the production of these, all due to a want of sane management.

A common mistake in the care of the pullet is a too frequent change in the diet. As a matter of fact, variation in diet is one of the most common causes of the false moult. The feeding should be as uniform in character as possible. Not only does the maintenance of the one diet prevent false moult, but it encourages a bird to attain its maximum

of production. The best example of the truth of this contention is conveyed by the egg-laying competitions where the one diet is used from start to finish. In view of the fact that the modern egg-type of pullet is put to a severe strain almost before it has attained maturity, it is imperative that it should receive every consideration in the matter of feeding and comfortable housing. Draught-proof houses (but given an abundance of fresh air), kept in a thoroughly clean condition, and providing ample accommodation, well-sheltered runs, green feed, clean water, grit, and a generous supply of food (with a proper proportion of animal food, given separately if possible) are indispensable.

CAPITAL.

I am being continually asked by correspondents as to the capital necessary to establish a poultry plant in order to ensure a good living being made. This is more of the nature of a conundrum than a question capable of being answered with any degree of satisfaction. Some men could establish a payable business on half the capital another would require, while others again would sink a fortune in the venture and then fail in their objective. It is, after all, more a question of the "man behind the gun." Capital is essential, but even more important is practical knowledge, and I fear the majority of those who inquire as to the capital necessary for a successful poultry plant know practically nothing of it. The best advice that can be given under the circumstances is to gain practical experience of the industry in a small way and expand the plant as the knowledge of managing it improves. In all businesses an apprenticeship is indispensable, and poultry-keeping is no exception. The other day a correspondent from abroad inquired as to the prospects of poultry-keeping in this country. He asked these questions: What is the price of land, the average price of feed, and the average price of eggs and table poultry. I knew at once he was a man of experience of the business, and having answers to the above questions (at the command of any local inquirer) he would know at once what it would cost to establish a poultry plant in the Dominion and what money there was in the business. While to the man with knowledge, enthusiasm, and some capital there is a good living in poultry, it is to be feared that many who are anxious to embark in the business are doomed to failure at the outset. The bulk of our poultry products is produced by men conducting the business as a side line, and it will continue to be so produced.

TABLE-POULTRY.

With the vast improvement that has taken place in the laying types of poultry and the consequent inducement to all classes of poultrymen, farmers as well as specialists, to breed nothing else but the improved strains, it has naturally followed that the supply of birds suitable for the

table has considerably declined. Not only have the special types most favoured by the poulterer almost ceased to be bred, but even birds of the lighter breeds are becoming finer in build and less suitable for the table. The old style of bird is passing away; indeed, it is doubtful in these days of increased cost of production if the special-purpose table-bird will pay to breed. The objective, especially on the farm, should be to breed the laying strains of the heavier breeds, the cockerels of which when properly fattened will furnish a profitable commodity, while the pullets will lay heavily in the dear months of the year.

At the present time White Leghorns are the fashion; but in view of the unsatisfactory marketing quality of the cockerels from these, and the fact that other heavier breeds are about as profitable, from an egg viewpoint, there is not wanting evidence that such breeds as Orpingtons, Rocks, and Wyandottes of the laying strain will soon largely displace the Leghorn type of bird. To the farmer these general-purpose breeds should specially appeal. They can be easily confined, are splendid foragers, and lay well when the eggs are most wanted. Then, the surplus cockerels are always saleable, as well indeed as the old hens after these have finished their laying period. Even should the farmer not consider it worth while going in for purebreds, cockerels of the breeds named will give improved money-making characters to his ordinary flock.

The demand for table-poultry in the Dominion, especially in the larger cities, where the standard of living is ever on the increase while the floating population and the volume of shipping is rapidly extending, is not only unsatisfied, but is wretchedly catered for. There is practically no such thing in this country as a supply of high-grade poultry, let alone decent tender-fleshed birds. While it is open to question whether the supply of capons and specially bred table-birds, such as an Indian Game-Dorking cross, would prove profitable, it is undoubted that properly fattened cockerels, especially if crammed, would well pay the producer who understands the business. It is not necessary that birds should be speci-



PROPERLY FATTENED COCKERELS.

ally bred for the purpose. The requirement is proper feeding from the chicken to the marketing stage—*i.e.*, that they should be done well from the time they leave the shell till killed, and that this period should be as brief as possible. Orpingtons, Wyandottes, and Rocks will all furnish cockerels good enough for any trade, provided they are brought to a prime stage with their chicken-flesh still on them.

At one time it was not feasible to do this, by reason of the fact that the pullets of the above breeds were not always profitable egg-producers. Now, however, there are laying strains of Black Orpingtons, White Rocks, and White and Silver Wyandottes which can hardly be improved upon from an egg viewpoint, especially when the winter egg is taken into account.

In subsequent issues of the *Journal* the question of rearing and feeding cockerels for the table will be dealt with in detail. The point desired to be here emphasized is the necessity of breeding the necessary raw material. Unless there is a good supply of this it is useless discussing the question of dealing with it.

SELLING BY WEIGHT.

A matter which should receive the attention of poultry societies is selling by weight. Not until this reform is brought about will the consumption of poultry be extended and the producer be induced to pay proper attention to this branch of the business. Under the present crude method of barter there is no encouragement to the farmer or poultryman to properly fatten his birds, and in dealing with any unsatisfactory article, such as the ordinary fowl sent to the market, there is always, and necessarily so, disappointment and dissatisfaction to all concerned—to the farmer, the dealer, and the consumer. One of the best means of encouraging the production of good table-poultry will be the placing of the marketing of the birds on a proper footing, and to do this the institution of a system of selling by weight is imperative.

HOUSING.

Several poultrymen who are at the present time constructing accommodation for their pullets are making the common mistake of building the houses too shallow. Experience points unerringly to the fact that the open-front house—draught-proof, but providing an abundance of fresh air—is the ideal method; but such a structure must have the necessary depth—10 ft. at the very least, while 12 ft. is better. The barely covered area, which will merely enable the birds to roost in comfort, is not sufficient; the birds should be provided with a building which will give dry-under-foot shelter on a wet day. Under these conditions the fowls can be fed in shelter in cold or wet weather. Then the birds will not be found moping about in the cold for their food, getting wet and chilled, the common conditions inviting disease, but will remain in shelter wait-

ing for their food, keeping themselves warm by scratching in the litter for any grains remaining from the evening meal. There is no necessity under this system to coddle the birds. They can be given free access to the run, but by being fed in the house they are induced to remain in this except when favourable weather entices them out.

THINGS TO REMEMBER.

To properly digest their food fowls demand an endless supply of grit.

You cannot make poultry-keeping pay by sitting on the fence and directing operations.

Many have succeeded with a small flock but have failed with a large one.

Gradual extension of operations with expanding knowledge is the only sure way.

The man who succeeds is he who has learnt his lesson well in the school of experience and makes a keen study of the business.

If you cannot obtain a dry situation, see to it that the property is well drained. If not, expect sooner or later the failure you have invited.

The small settler and farmer will find well-bred and profitable pens of birds a never-ending pleasure.

Many maintain that poultry kept in large numbers will not pay. They are quite right—if the large plant is in the hands of the wrong man.

When selling birds by weight, every extra ounce of flesh means increased profits to the producer and greater satisfaction to the consumer.

Many of the fads introduced in regard to breeding and feeding have died a natural death.

To secure eggs in the dear season fowls must be bred at the right time, and have an ample ration of animal food.

It is an easy matter to make poultry-farming pay on paper. Theory is all very well in its place, but it must go hand-in-hand with experience.

Time is money. Arrange the plant so that the maximum amount of work can be done with a minimum call on labour and time.

The desire to run a commercial poultry plant by people of little cash and less experience is a common complaint. The inevitable result is disaster.

In laying out a plant have in mind future developments, so that when extension is necessary the general arrangement of the enlarged plant will be systematic and capable of control.

Doctoring sick birds is poor economy. The food consumed by affected birds which finally die is often a serious drain on the profits of the healthy stock.

During the past five years the number of poultry in the Dominion has increased by half a million head, and yet prices are as high as ever, and decent table-birds are at a premium.

WEATHER AND CROPS.

JANUARY.

OFFICERS of the Fields and Experimental Farms Division of the Department report as follows on the weather of the past month and the condition of pastures and crops:—

BAY OF ISLANDS.—Rain has been scarce in most parts of the north for a month. Hokianga has been favoured with a fair fall, and the pastures are of medium quality all through that country. The Bay of Islands district is looking burnt up, and badly requires rain; streams are going completely dry in many places. Generally the weather has been very dry. Green maize is growing much better. There are some fine crops, but generally green maize is backward. Good crops of *paspalum*, cocksfoot, and potatoes.—*W. J. Dunlop.*

AUCKLAND.—The weather conditions of January showed a marked improvement on those of December. The rainfall was just sufficient to benefit the growth of grass and other crops, particularly the root crops, which are coming away well. Everything for the season of the year is looking splendid. So far there has been nothing serious to check the milk-supply, the mildness of the season and the plentiful supply of grass inducing a maximum flow. A record year for the dairy-farmer is in sight.—*R. Rowan.*

HAMILTON.—With the exception of a few showers, the past month has been dry and warm. This being an exceptionally good season for grass and clover, a larger quantity than usual is being made into hay for winter use. Grain crops are good, and the weather is favourable for harvesting operations.—*J. Kerr.*

KING-COUNTRY.—The weather during the major portion of the month was all that could be desired for the farmer. A few semi-tropical showers, although temporarily delaying harvesting operations, had a compensating effect upon pastures and recently sown root crops. Tillage has been carried out under favourable conditions. Harvesting and shearing have progressed satisfactorily, the latter being almost finished.—*B. Bayly.*

TE AROHA.—The weather has been good. Occasional showers of rain have been beneficial to pastures and root crops and not detrimental to the cereal crops. Oats are very good throughout, and should the weather continue favourable for a week or two the harvesting will be practically over. It should prove a record year for oats. There is an abundance of feed. Potatoes are good where blight is absent, but disease is prevalent in the district. Turnips and rape are looking fair—no indication of fly as yet.—*J. L. Morris.*

CAMBRIDGE.—The weather has been very fine. A good day's rain fell on the 18th instant, and nice showers at intervals. The harvest has been got in in good order. Had a slight frost on the morning of the 22nd. Maize is looking well. A good strike of turnips; fly not bad. Fair crops of rape, generally speaking. Grain crops saved in good condition. Blight fairly prevalent in potatoes.—*A. A. Clapcott.*

NEW PLYMOUTH.—Heavier rainfall than usual and a lower temperature. On the night of the 20th snow fell on the mountain, and the ranges had a slight covering. Great difficulty has been experienced in gathering the hay, which, contrary to early indications, has been an excellent crop. Only a few oats have been harvested so far. Both wheat and oats, as anticipated, will yield well. Maize is very backward and poor. Both turnips and mangels are growing well. The potato crop is the best for years, and so far there is little blight. There is an abundance of grass everywhere, and consequently the cows are keeping up their supply of milk. Although the factory supply is below that of last year, there is every probability of the deficiency being made up during the remainder of the summer and autumn.—*R. E. Fairfax-Cholmeley.*

STRATFORD.—Very fine month, and has improved the crops and pastures wonderfully. The good spell has enabled most of the hay to be got in and the sowing of turnips to be completed. Shearing is now almost finished. Although there is an abundance of feed, farmers still complain of a shortage of milk, but they are compensated by a higher test. A fair amount of ensilage has been made in the district. The prospects for the winter have greatly improved owing to the favourable month. All crops look well except maize, which has suffered by the absence of warm weather in the earlier stages of growth.—*A. F. Wilson.*

OHAKUNE.—The rainfall for the month was 3.17 in. The weather throughout has been favourable both for cereal and root crops, the only exception being the potato areas, which suffered in consequence of a sharp frost. Pastures at present provide an abundance of feed. Shearing has been slightly retarded, but is at last practically finished. Up to the present conditions have not favoured good burns. Oats for chaffing are short but are well headed. They promise to make first-class samples of chaff. Cocksfoot for seed is not too promising. Good strikes of turnips and mangels; areas that have received careful cultivation are looking remarkably well.—*P. Barry.*

HAWERA.—The weather during the past month has, on the whole, been favourable for dairy-farming. There is plenty of grass about, and settlers of experience say they have seldom seen the country looking better at this time of the year. Factory returns are satisfactory, and are to some extent compensating for the smaller supplies earlier in the season. Farmers have been busy during the month getting in hay and ensilage, large quantities of which have been secured. Green maize will not give a heavy yield, roots are coming on well, and oats are late, but should give an average return.—*A. J. Glasson.*

WAIROA.—Weather conditions throughout the month were of a favourable character, the rains inducing an abundant growth in pastures and crops generally. All classes of stock are looking really well, and the outlook for the whole of the district is much more promising than was anticipated a few weeks back.—*T. F. Mullaly.*

HASTINGS.—The weather in January was very hot and dry. On the 18th instant about half an inch of rain was general, and a similar quantity fell on the night of the 29th. Pastures are very much burnt up. Root crops are poor and backward, while there is a fair growth of green feed. Owing to favourable spring growth, stock have done extremely well.—*J. G. Parker.*

WAIPIKURAU.—A very dry month. On the 29th and 30th we had very light rain, which helped the rape and turnips, there being no growth in lea paddocks north of Takapau. South of this there is a fair growth.—*H. O. M. Christie.*

WANGANUI.—The fine weather, with occasional showers, which fortunately obtained during January, although no great heat has been experienced, has been of incalculable service in maturing grass-seed and cereal crops, facilitating harvesting operations, stimulating growth of roots and green crops, and in giving substance to the feed in pastures which, owing to the long period of intermittent rains and absence of warmth, had been relatively poor in quality though abundant in quantity. More hay than usual has been harvested, and the farmers' outlook for the future is bright. All crops are looking well but green maize, which is stunted.—*C. Watson.*

MANAWATU.—Weather conditions have improved considerably during the past month, although still unsettled. The improved conditions have hardened up the pastures, which are now good. Crops have also benefited. More sunshine is badly required.—*W. Dalgliesh.*

PAHIATUA.—January weather was fairly good. It enabled shearing to be completed, crops to be put in, and hay and corn to be harvested in a good condition. There is an abundance of feed, and from all appearances stock generally will be fairly well provided for during the coming winter. Ensilage is being made on several farms. Roots are late but are looking well, but green maize is very late and poor.—*T. Bacon.*

WAIRARAPA (AKITIO AND CASTLEPOINT).—Some very warm days, with rain at intervals, which kept the pastures green except on the high country, were the features of January weather. Crops are looking exceptionally well, and there will be a much better return than has been the case for some years. Oats in particular are a very heavy crop. Maize, too, has grown very well, and on many dairy farms there should be a good supply of this fodder for cows during the months when other feed is scarce. Much more maize has been grown this season than last.—*T. C. Webb.*

WAIRARAPA (NORTH-WEST).—The weather was particularly good last month. White and root crops were greatly assisted by occasional showers. The wet weather

of the preceding months made the grass soft, and encouraged it to run to seed. It has now improved and is plentiful. Turnips are promising, but rape is not as good as usual. Wheat should be well up to the average, but oats below it.—*J. S. Rankin.*

WELLINGTON.—A long-wished-for improvement in the weather conditions freshened up pastures and crops generally. Considerable loss has been experienced in potatoes, owing to being rushed on the market through the outbreak of Irish blight. Hill country is now looking well.—*G. H. Jenkinson.*

BLENHEIM.—The weather for the month has been most unseasonable. Heavy thunderstorms were noticeable on the 20th towards the coast, and, it is reported, were followed up by a fall of hail. On the 21st there was cold rain most of the day, and the hill-tops were covered with snow on the following morning. There has been a fair amount of rain over the district, a good deal of wind, and very cold conditions for this season. The Upper Wairau and Mount Pleasant portions of the district experienced a sharp frost on the night of the 21st. The weather for the past week has been warmer, with three very hot days. Pastures are better than usual, but there is practically no green feed. Turnip crops are disappointing, but rape and mangels are looking very well.—*F. H. Brittain.*

NELSON.—The weather for the past month has been more or less showery. This has retarded the ripening of the grain crops, and has delayed the harvesting of those that were ripe or in stook. It has suited the pastures and green and root crops, which are looking well. The grain crops on the whole are good, oats being exceptionally so. Fully two-thirds of the grain crops are in stack, and late ones are ripening and a few are being cut.—*G. J. Ward.*

HOKITIKA.—The weather during the past month has been very changeable and wintry at different periods, with several days' heavy rain, but at the time of writing it looks quite settled, and there is every indication of getting a little summer at last. This will be very acceptable after so much unseasonable weather. Pastures are looking exceedingly well, and green feed is plentiful. Root crops are late, but are looking well. Oats are very backward. Blight is very prevalent in the potato crops.—*J. H. Walton.*

KAIKOURA.—The weather during the beginning of the month was inclined to be damp, with light rains prevailing. Towards the middle the weather took up and a hot dry spell was welcomed by farmers, who were busy harvesting their crops. There are some excellent crops of oats. Speaking generally, crops will be above the average. Turnips have suffered very badly through the ravages of the turnip-fly, and potatoes are showing signs of Irish blight. Pastures are good, and plenty of feed is about.—*W. S. Goodall.*

AMURI-CHEVIOT.—During the early part of the month there was a good deal of rain, which delayed shearing operations very much. Owing to the unfavourable weather a good deal of shearing is yet to be done in the back country. The rainfall for this month was 1.19 in. For the previous month (December) it was 4.73 in., rain falling on thirteen days. Feed is abundant. There are some very fine crops of grain, and there is every promise of big yields. Green crops, such as turnips, rape, and mangels, are looking well. Potatoes are also good, but considerable blight is now in evidence.—*W. M. Munro.*

RANGIORA.—The weather from Christmas to the New Year was very wet, and caused heavy floods on the flats, especially at Flaxton and the lower parts of Sefton. In a good many cases potatoes have been flooded and rotted. Peas have rotted off at the neck, and several patches of turnips, mangels, &c., where the water lay any time, rotted also. Some of the paddocks about Flaxton have been denuded of grass, the water remaining so long on them before it could be run off. On the higher land the crops are looking well, but bare patches can be seen among them where the water lay in small basins. There is practically no blight in the turnips.—*A. Hughes.*

LINCOLN.—The weather remained unsettled throughout the month. The rains which fell, although hindering harvesting operations, did little serious damage to the grain, whilst rape and turnip crops greatly benefited therefrom.—*J. G. Scott.*

ASHBURTON.—Beautiful weather during the month. Rain fell in the borough on thirteen days: total rainfall, 1.95 in. The heaviest fall was on the 26th. There was no frost during the month. Crops are ripening fast, and harvesting will be general in a fortnight. The turnip-fly is troublesome this season, and there is a good deal of smut in the oat crops.—*C. Branigan.*

TIMARU.—Heavy rain with cold south-west winds and occasional north-west rain and wind. The weather is very unsettled. All crops are looking well, and there is great feed in the pastures.—*J. C. Huddleston.*

FAIRLIE.—Very favourable weather has been experienced during the month, and the crops are now ripening fast. There is every promise of a record yield in grain crops. Harvest will be late. Rape and grass is plentiful, and stock is fattening well.—*W. B. Manning.*

WAIMATE.—Although occasional cold snaps and showery weather were experienced, the weather in January was most favourable. Seldom has feed at this time of the year been so good, late rains being accountable for the exceptional growth at this season of the year. The opinion is now general that there will be ample feed to carry stock through the winter months. Cereals look exceedingly well, and late-sown crops of both wheat and oats look splendid. Several settlers on the new Douglas Settlement have expressed their intention of trying lucerne. Peas, which cover a greater area than usual in this district, look extremely well. The same might be said of beans and potatoes. Turnip and rape crops are exceedingly good, probably the best for some considerable time. Should seasonable weather continue, record yields all round may be expected.—*F. A. Mardonald.*

KUROW.—Damp muggy weather has prevailed during the past month, and farmers are crying out for warm weather to ripen their crops. Several paddocks of oats and barley have already been cut, and, judging from the number of stooks, should thresh well. Several hailstorms have caused considerable damage to ripening crops in the Tokarahi district. Sheepowners have been greatly retarded in their shearing operations owing to wet weather, and a large number of sheep still remain unshorn.—*G. Reid.*

OAMARU.—Notwithstanding the considerable rain we have had these last two months, the agricultural prospects in North Otago could not be better. I think it would be impossible to find a poor crop of either wheat, oats, barley, rye, rape, potatoes, turnips, or grass, and if we can only get more sunshine for the next few weeks the returns will constitute a record for this district. Hessian fly is reported among some of the wheat crops at Kauroo Hill district, but not to any extent; and smut and rust among the oat crops is rather prevalent. A good deal of the crops are down and twisted badly, but given fine weather these will improve. The rainfall for the month was 2.93 in. We had a frost on the night of the 25th, which cut a few tops off some of the potato crops. On the whole, North Otago farmers are jubilant.—*S. M. Taylor.*

PALMERSTON SOUTH.—The weather is still unsettled, and no summer whatever has been experienced so far. The harvest is a month later than last season. Several crops of oats have been reaped, but it will not be general until another ten days. There is a considerable amount of rust and smut in the oat crops. The Hessian fly has made its appearance in the wheat, but not to any extent; have only heard of one instance to date. Given nice bright weather heavy yields and good samples may be considered as certain. Although some crops have been laid, as a general rule they are standing the effects of the weather well. Pastures are good, and there is abundance of feed. Root crops are making fair progress, but September-sown mangels are going to seed.—*C. S. Dalgliesh.*

DUNEDIN.—During the early part of January the weather cleared up a good deal, and diligent farmers got their hay crops saved. From the middle of the month there were many heavy showers, which retarded haymaking. A number of farmers have only been able to sow their turnips during the last two weeks. The early-sown turnip crops are spoiled by the rain of December. Early-sown mangels are inclined to go to seed; later-sown are looking fairly well. Potato crops are light and backward. Pastures are luxuriant, and there is an abundance of feed everywhere.—*J. R. Renton.*

MANIOTOTO.—The district, generally speaking, is looking well. There was a fair amount of rain, but real heat on only a few days. Frost on two nights during the month did much damage to potatoes on the plain, in some cases cutting down the shaws completely. Given some hot weather, harvest will be general in about three weeks. All stock is looking well.—*A. T. N. Simpson.*

OWAKA.—The weather for this month has been very mixed. It started with very warm conditions, which brought everything along very nicely, but towards the middle and end of the month we had very strong gales, followed by heavy rains. All crops are coming away fine now except a few crops of oats in the bush portions of the district; these are very backward. The turnips that are in are looking well, but there are a lot to be sown yet. The wet weather has been a great hindrance.—*T. D. Urquhart.*

LUMSDEN.—January was a very wet and windy month. A good deal of damage was done to the oat and wheat crops by high winds. The climatic conditions are also making the harvesting of grass a difficult matter. Nevertheless, from all appearances, and given fair weather, farmers should reap a fair return. Winter feed should be plentiful, as the turnip crops are looking remarkably well.—*W. S. S. Cantrell.*

MOSGIEL.—During the month of January rain fell on fourteen days. On the 18th and 25th heavy thundershowers did great damage to some of the heavy crops. Patches are lying down and will not rise again. Even on the ridgy lands the crops are better than for many years. Turnips are looking well, and there will be a record yield if the blight keeps away. Mangels are not doing well, owing to too much rain and cold weather.—*H. McLeod.*

CLYDE.—January weather was very changeable. There were few hot days, and cold nights and mornings have been the rule. A frost was experienced in some places about a week ago. The grass and crops are much better than usual, but the fruit crop is very late. Shearing is now about finished, being much later than usual owing to the showery weather. The wool in most cases was clean and bright, and the sheep clipped well. Stock of all kinds are in good order.—*T. N. Baxter.*

STRATH TAIRI.—The weather during the past month has been fairly good, although on the cold side, with an occasional frost, which has given potatoes a check. Rainfall, 2.20 in. Pastures are good, and also cereal crops. All stock is looking well.—*W. Scott.*

BALCLUTHA.—The weather for the past month has been an improvement on that of the two former months, but so far we have not had any summer weather. A fair amount of rain and a low temperature. The harvest will be late, but all crops are very heavy, and a lot of them are down, especially grass-seed fields. Potatoes are now affected with blight in places. In a good many cases early-sown turnips have gone to seed, in some instances before they were thinned.—*H. A. Munro.*

TAPANUI.—A few very cold days have been experienced during the month, but growth on the whole has been fair and grass is still in abundance in Tapanui and surrounding districts. Crops promise heavy yields, though a month later than usual. The upper districts—Roxburgh and Miller's Flat—require rain badly, as pastures are very much dried up on the low country, but the high country is looking splendid. Star thistles have been in abundance, and are much appreciated by runholders in the upper districts. Rainfall for month: Tapanui, 3.40 in.; Roxburgh, 1.59 in.—*W. J. McCulloch.*

LAWRENCE.—The fall for January was 3.72 in., rain falling upon twenty-one days. The weather was favourable for the growth of all crops, but plenty of warm weather is required to ripen them. Harvest will be at least six weeks later than in previous years. Shearing is practically finished. Fat lambs are scarce, owing to rape being backward.—*R. Barron.*

GORE.—During January there was good growing weather, consequently crops and pastures are looking well. The grass harvest should now be in full swing, but the wet weather of the past week checked it. During the month rain fell on seventeen days, the heaviest fall being 0.52 in. on the 17th, and the total for the month 2.94 in.—*B. Grant.*

INVERCARGILL.—The weather for the month of January was more favourable for agricultural pursuits than the previous three months, but could have been better for harvesting the grass crops, as we have had rather too much wind and rain. Pastures and grain crops are looking well, but turnip and rape crops are not up to the usual standard. There are a lot of very patchy paddocks of turnips, and rape in many instances has been a failure.—*J. R. Whyhorn.*

OTAUTAU.—The weather during the month was showery, with a fair amount of wind, causing grass-seed and some wheat crops to lie down, but has been good growing weather withal. Turnips are all in, and what are up are looking well and promise fine yields. Very little rape is grown this year: owing to cold weather during sowing-time the seed failed. Oats are not so heavy on the whole, though some fine crops are to be seen, and promise a heavy yield. Potatoes are looking particularly well, in spite of being touched with the frost last month.—*H. F. Dencker.*

QUEENSTOWN.—Apart from a few showers, with cold winds, the weather has been fine. The district is badly in need of rain, especially throughout the farming area. Feed is plentiful on the higher country.—*A. Clarke.*

The headpiece on page 89 is a view of Waerenga Experimental Farm, showing the homestead, the vineyard in the distance, and the nursery on the left.

THE FRUIT CROP.

THE Director of Orchards, Gardens, and Apiaries has received the following district reports from his field officers for the month of January on the condition of the fruit crop:—

WHANGAREI.—Weather fine and dry, with occasional light showers the greater part of month. All stone fruits coming to hand in large quantities. Apples and pears as yet in small quantities on market. In apples the best quality fruit is Gravenstein, Astrachan, and Sharp's Early, and in pears Doyenne d'Ete and Jargonelle. Oranges are setting fairly heavily. Second flight of moth made its appearance about middle of month.—*J. W. Collard.*

AUCKLAND NORTH.—Weather warm and dry throughout month. Owing to early plums and peaches being later than usual this had effect of hardening prices. Peaches, midseason and late varieties, prospects good; English plums crops below average, Japanese and Burbanks prices fair; pear prospects variable; apples, late varieties show good prospects; tomatoes responding well to improved climatic conditions; potatoes, good yield; strawberries, not too profitable this season; grapes, prospects good average crop.—*W. C. Thompson.*

AUCKLAND SUBURBS.—No change from last month so far as fruit prospects are concerned; they are, if anything, brighter. The weather has been quite summer-like, and in marked contrast to the weather up to the end of the year.—*W. R. L. Williams.*

GISBORNE.—Fruit prospects not too bright, rainfall being short of requirements. Apples showing up slowly; pears fairly good; Japanese plums poor; English plums poor; peaches scarce; nectarines scarce; apricots below medium; tomatoes poor and late; vegetables generally a failure.—*W. R. L. Williams.*

AUCKLAND SOUTH.—Apples good to heavy; pears, early good, late heavy; plums heavy; peaches and nectarines light to good; potatoes poor to fair; apricots, very successful season with high prices through season; tomatoes, crop only fair to good this season, on account of weather conditions when plants were young.—*N. R. Pierce.*

WANGANUI.—Apples a full crop, but slow maturing; pears fair crop, but backward; peaches fair to poor; apricots a poor crop; plums a heavy crop except European varieties; trees are now making up growth lost owing to bad weather in early summer. Potato-blight prevalent; other vegetables promise satisfactory results.—*W. C. Hyde.*

PALMERSTON NORTH.—During the past month the weather has been much better for fruit crops. Peaches, earliest varieties nearly over; nectarines nearly ready for picking; apples little better than first anticipated; pears showing well, most growers being satisfied with crop. There is very little black-spot about, but leech is doing considerable damage in parts. Growers are busy spraying for codlin-moth. Earliest varieties of apples—Irish Peach, Red Astrachan, and Gravenstein—are being sold in shops.—*G. Stratford.*

HASTINGS.—The orchards throughout district are looking well except some young orchards planted last season, which have suffered from wind and drought, especially where shelter is lacking. Through the dry weather and insufficient thinning, some of the fruit is rather smaller than usual, otherwise the fruit season up to the present has been good. The prospects ahead are excellent; apples and pears are in abundance everywhere.—*J. A. Campbell.*

BLENHEIM.—Apples good; pears good; peaches good; plums good; apricots only medium, and are finding a ready demand locally; Japanese plums, good crops, especially Burbanks; tomatoes a fair average crop; glasshouse tomatoes a fair crop, but nearly all done. Vegetables of all kinds are plentiful; potatoes are looking well, and no blight yet observed.—*E. Rabbits.*

NELSON.—The weather is keeping warm, and the crops are coming on well. Raspberries, apricots, and peaches are ripening freely. The early varieties of apples and pears are being sold, but black-spot is prevalent. Up to the present little moth has appeared, but is showing more rapidly now. Tomatoes are now ripening up. The supply of vegetables is well maintained.—*J. L. Williams.*

CANTERBURY.—There has been no alteration in the fruit prospects during the past month. Pear-scab and black-spot are rather troublesome this season, owing to continued wet weather. In some localities three or four sprayings of Bordeaux were found necessary to keep pear-scab under control.—*W. J. Courtier.*

TIMARU.—Plums fairly plentiful; apples are also coming on the market; peaches and apricots arriving from Teviot in fair supply. Spraying for codlin-moth in infected districts is being carried out with good results.—*J. H. Thorp.*

OTAGO.—Small fruits practically over. Main crop apricots, peaches, plums, are being picked; apples and pears are looking well; tomato crop light.—*W. T. Goodwin.*

HONEY PROSPECTS.

THE Director of Orchards, Gardens, and Apiaries Division has received the following reports on the honey-crop prospects from the Apiary Instructors:—

MR. G. V. WESTBROOKE, AUCKLAND.—This month has been stormy up till the 25th, and the bees could only gather occasionally between showers. In North Auckland the prospects are decidedly favourable for a good yield. In the Waikato the season is very late, but there are now prospects of fine weather, and the bees are very busy; should this continue during January and February the yield south of Auckland should be fair. The honey so far seems of a superior quality than usual, owing probably to the bad weather, the honey-flow from the tea-tree preventing this inferior honey being gathered.

MR. F. A. JACOBSEN, WELLINGTON.—The prospects for the honey crop in the three provinces directly in my charge—Taranaki, Hawke's Bay, and Wellington—are about the same as in other parts of the Dominion. The windy wet spring has interfered greatly with the flow of nectar in the various flowers and clovers, and unless the wind drops and the temperature keeps between 70° and 80° the prospects of a good crop are but slight. With steady fine weather good returns may be expected.

MR. E. G. KENNY, CHRISTCHURCH.—Present conditions of honey crop unfavourable unless we get a month of fine sunny weather.

MR. E. A. EARP, DUNEDIN.—The continued bad weather has been very disastrous to beekeepers in Otago and Southland. At the commencement of spring colonies were doing well, breeding going on very satisfactorily. Splendid rains fell in October and November, and everything pointed to a record crop of honey; however, the wet weather continued unabated all through December, and this, combined with low temperatures, has given the colonies a complete set-back. All round I hear bad reports of wholesale losses. In many instances complete apiaries have been wiped out, due entirely to shortage of stores. Very few apiarists have records of swarms. Queen-breeders raising queens on a commercial scale in the south have been handicapped in operations owing to unfavourable conditions.

To ensure greater efficiency in the employment of experts for promoting agriculture the Congo has been divided into six agricultural circuits, each of which will be under the direction of a district agriculturist, aided by a staff of efficient assistants. A meteorological division has been created, experimental gardens have been established at three centres, and an agricultural research laboratory is to be placed at the disposal of settlers.

ANSWERS TO CORRESPONDENTS.

COLLAR-ROT OF LEMON.

MR. G. W. HESLOP, Māteretu, Kaipara, writes,—

Would you kindly tell me what is wrong with my lemon-trees. The bark has come off on one side of the main stem near the ground, and a resin-like gum has been exuding out of the bark for some time, the bark also having an oily appearance. Also, what is the best manure for citrus fruits?

The Director of Orchards, Gardens, and Apiaries replies,—

Judging from the description given, I should say there is no doubt the trees have been attacked by a disease known by several names: in Italy it is called "Mal-di-goma,"; in Florida "foot-rot"; in New Zealand the name "collar-rot" is generally applied. Treatment: Remove the soil for 2 ft. or more around the trunk, destroy all diseased bark, and apply to the wound a 10-per-cent. solution of carbolic acid, or a solution of 1 lb. of sulphate of iron in a gallon of water—the former for preference. Replace the soil. Provide good drainage, and avoid nitrogenous manure.

ENSILAGE MADE WITH LOTUS CORNICULATUS.

MR. L. A. RUNCIMAN, Auckland, asks,—

Will clover principally *Lotus corniculatus*, make good ensilage for dairy cows, and will it taint the milk?

The Fields and Experimental Farms Division replies,—

Yes, *Lotus corniculatus* will make good ensilage, although we have never made a stack entirely of that clover, it being usually slightly mixed with other grasses. Ensilage does not taint the milk when fed out in an open paddock, but the quality and quantity of the yield is improved when cattle are regularly fed on well-matured ensilage.

PLANT-DISEASE AND LUCERNE-GROWING.

"D. J.," Hawke's Bay, writes,—

I wish to know what blight attacks the *Pinus insignis* or *muricata* pines, and the spray that will give the best results for same. It is a white furry coating over the trees, and it checks their growth and some die.

Also, is it right that lucerne (the Hunter River seed) will not grow after field peas ploughed under for manure? I have given it a good dressing of slag, and the soil is a very light sandy loam. Is the seed best for the kind of soil?

The Fields and Experimental Farms Division replies,—

The insect attacking the pines will be one of the species of the pine white blight (*Chermaphis* sp.), close relatives of the American blight of apple-trees. These insects are especially destructive to *Pinus sylvestris* in New Zealand, and render the cultivation of that tree almost impossible in the Dominion. They are also frequently found on other pines, especially *Pinus austriaca*, *Pinus insignis*, and *Pinus muricata*, but rarely in sufficient numbers to cause their death. There appears to be a great degree of individual resistance against attack among plants of the same species, certain individuals remaining almost unaffected while adjacent

plants may be quite severely attacked. *Chermaphis* is rarely troublesome in New Zealand after the trees have passed their tenth year, and the attack generally diminishes before the trees have attained that age. Winter spraying with red-oil spray, used at the rate of 1 gallon of oil to about 30 gallons of water, should be effective. Summer spraying cannot be done with any degree of safety on pine-trees with red oil, and the ordinary summer washes, such as kerosene emulsion, do not seem to have very much effect on this insect. In general, however, little if any spraying is done for this insect, and its effects are in the main not sufficiently serious to call for any special remedies being taken.

Lucerne can well follow a crop of peas turned in, and when such is done there is not the same need for the use of inoculated soil as when the lucerne follows ordinary pasture. It is considered that both French (Provence) seed and that locally harvested in the Marlborough District are quite as satisfactory as Hunter River seed, and are generally considerably cheaper.

BEES.

MR. A. A. STRATFORD, Orinoco, Nelson, writes,—

What is the date of the earliest swarms of bees at the Government apiaries? My first swarm was on the 6th October, the earliest I know of. I know of two others the next day.

Do you think it a good policy to let the bees swarm on till the beginning of the third week in November, providing one hive does not swarm more than three times? I returned the third swarm of all my hives. I started with four hives of pure Italians, and have now twenty hives with pure Italians in them. I caught several common swarms. I have black bees 500 yards from me, and out of sixt-en hives had one mated.

The Director of Orchards, Gardens, and Apiaries Division replies,—

In ordinary seasons swarming sets in in the Waikato in the second half of October, but if the season is late it may be delayed till the first half of November. At the Government apiaries every precaution is taken to keep back swarming, which rarely takes place till December. Any increase desired is done by dividing (artificial swarming).

If increase in colonies alone is required your policy is good, but in order to produce a good crop of honey you must endeavour to prevent your hives from swarming. A colony that has swarmed three times will not be in a fit and strong condition to gather a good surplus when the honey-flow commences, and the bees will perhaps only gather enough or very little more than will keep them through the winter. It is the chief aim of a honey-producer to keep his bees from swarming.

TWITCH-GRASS. —SALT SPRAY.

MR. ROBERT TAYLOR, Te Araroa, writes,—

I see in the *Journal* you speak highly of twitch-grass for poor stony land. I have some land parts of which is pure shingle. If you can tell me where to get some twitch-seed I will try it.

Could you tell me in your columns what kind of fence will stand the salt spray best, and what trees? I have planted a few willows in a soft low place, and they have taken hold. I have *paspalum*, *danthonia*, birdsfoot trefoil, potatoes, pumpkins, and Soya beans. The Soya bean is looking the best, and it is not doing much. The birds-foot trefoil came up well and then stopped. I am trying other seeds.

The Fields and Experimental Farms Division replies,—

Twitch-seed is not on the local market, but some could, no doubt, be secured from some of the southern seed-merchants if specially asked for.

The following are amongst those plants that withstand considerable amounts of sea-spray: (1) *Akeake* (*Olearia Traversii*); (2) *Pinus pinaster* (*P. maritima*); (3) *Pinus halipensis*; (4) *Cupressus macrocarpa*; (5) *Pinus muricata*; (6) *Tamarix gallica*.

COCKSFOOT.

"INTERESTED," Flaxton, writes,—

I am interested in the growing of cocksfoot for seed. Could you inform me through the correspondence column of your *Agricultural Journal*—(1.) What would you consider a proper seeding on a moist peaty soil with a clay subsoil? (2.) How many years is it before I can expect a good paying crop, as I understand that the first year at least is no good? (3.) About what time in the spring should it be shut up?

The Director of the Fields and Experimental Farms Division replies,—

A peaty soil is not the best class of land for the growing of cocksfoot for seed. The seed produced on such land is generally inferior to that produced on lighter soil with a fairly stiff subsoil. About 18 lb. of seed per acre should be sown. This should be fed off with stock the first season, and the paddock should be shut up for seed about the middle of August of the following year. The crop should then be ready for cutting about the third week in January. The average yield per acre is from 160 lb. to 450 lb., depending on the weather that is experienced.

FRANCE AND REFRIGERATED MEAT.

"THE Argentine Republic and New Zealand had erected at the Roubaix Exhibition, in their respective courts, freezing-chambers, and exhibited thus, under glass, quarters of beef, mutton, joints, and wild rabbits. The Argentine installation comprised a chamber at $+2^{\circ}$ and another chamber at -8° . The New Zealand installation consisted of a compartment chilled to -8° . The meat in the chamber at -8° had been preserved from 20th June to 6th November. It had maintained throughout the appearance and qualities of meat suitable for food. The newspapers reported that at an official banquet in celebration of the Exhibition the Mayor of Roubaix, Monsieur E. Motte, in the midst of the repast, after a roast which every one had found delicious, announced to those present that they had been eating Argentine mutton, frozen for more than three months. 'I wished to demonstrate,' added Monsieur Motte, 'that in abolishing a prohibition which nothing justifies, the Government could place at the disposal of our population an excellent diet, within the reach, owing to its cheapness, of every artisan.' Let us add that at one of the meetings of the Northern General Council, Monsieur Vancauwenberghe narrated the incident, and added: 'In a period of dear living, do you not perceive that there is here a resource of the first importance, and that it seems that we have been deprived too long of this eminently palatable meat?' This reminds us that an offertory of frozen meats to the Assistance Publique (Charitable Relief) would have been refused upon the advice of the Sanitary Service."—*L'Hygiène de la Viande et du Lait*.

[In connection with the above it is interesting to recall that in 1907 Professor Gilruth, then Chief Veterinarian to the New Zealand Government, gave a dinner in Paris to which certain scientists and representatives of the freezing industry in France were invited. The menu, comprising dishes prepared almost exclusively of frozen New Zealand produce, was highly appreciated by all present.—ED.]

In the 1910-11 wool season of the Argentine 88,286,034 kilos (kilo = $2\frac{1}{2}$ lb.) were received, against 79,275,113 kilos in the previous season.

SHIPMENTS OF PRIMARY PRODUCE FROM NEW ZEALAND TO UNITED KINGDOM.
COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.	Mutton, Carcases.	Lamb, Carcases.	Beef, Quarters.	Butter, Boxes.	Cheese, Crates.	Wool, Bales.	Wheat, Sacks.	Oats, Sacks.	Rabbits, Crates.	Hemp, Bales.	Tow, Bales.	Kauri- gum, Cases.	Sundry.
October,	1911 9,417 1910 49,010	2,043 800	100 10,551	49,626 60,014	11,501 9,159	2,182 3,189	.. 94,815	.. 23,330	52,094 36,947	4,511 3,632	151 1,232	2,982 3,089	.. 56 carcasses pork.
November,	1911 47,770 1910 62,996	10,427 29,877	403 5,554	135,741 105,759	57,319 27,749	44,934 55,551	15,893 76,594	.. 331	16,606 28,646	7,844 6,850	2,183 2,300	3,085 4,339	.. 911 carcasses pork.
December,	1911 72,192 1910 82,405	91,965 157,172	765 13,155	109,397 182,051	46,883 67,162	54,297 59,080	.. ..	.. ..	4,366 9,716	5,719 4,524	1,364 109	2,708 5,363	.. 686 carcasses pork.
January,	1912 237,284 1911 175,337	302,399 287,120	12,424 13,568	114,512 90,405	64,005 46,375	95,994 127,199	.. ..	.. 16	7,995 399	6,365 15,234	1,942 3,302	3,407 7,094	59 carcasses pork. 590
February,	1911 242,090 1910 196,093	450,406 414,408	24,924 23,798	86,368 97,766	46,667 62,192	70,030 102,182	23,694 4,724	200 8,600	.. ..	4,428 4,223	1,302 2,314	2,113 4,827	1,369 carcasses pork. 1,719
March,	1911 264,297 1910 222,058	665,822 413,179	26,657 22,134	45,912 77,319	40,668 42,029	58,362 64,266	40,276 2,899	.. 3,636	.. ..	3,650 9,152	1,583 2,490	8,982 2,959	2,408 carcasses pork. 798
April,	1911 172,503 1910 209,120	491,413 559,166	19,106 29,355	14,823 46,524	33,411 44,032	42,917 32,920	38,456 21,855	6 1,934	.. 12	9,233 10,179	1,827 2,951	2,577 4,250	2,431 carcasses pork. 627
May,	1911 204,390 1910 310,196	377,105 622,232	20,173 38,276	995 9,588	20,732 28,384	33,033 25,123	93,854 81,052	.. ..	.. 3,010	7,443 10,017	1,210 2,346	7,720 3,150	1,087 carcasses pork. 1,293
June,	1911 214,079 1910 299,596	448,432 555,777	15,789 60,286	.. 495	6,323 17,963	19,568 21,260	39,422 13,707	.. ..	14,128 8,988	4,763 6,180	525 2,684	5,528 7,104	2,434 carcasses pork 658
July,	1911 206,869 1910 249,906	260,761 334,753	14,296 71,160	.. ..	276 595	14,100 12,816	29,452 20,604	.. 1,106	10,334 8,649	6,022 6,695	1,073 1,437	2,786 8,272	175 carcasses pork. 2,448
August,	1911 66,608 1910 94,468	110,054 97,899	3,653 16,440	.. 634	.. ..	5,260 5,361	31,976 33,970	.. 273	18,231 22,629	3,443 1,378	303 720	3,475 6,793	203 carcasses pork. 362
September,	1911 102,081 1910 104,925	40,057 26,416	6,059 8,420	6,404 22,644	.. 41	7,390 6,539	38,151 40,876	.. 3,863	33,059 7,721	5,604 2,680	393 597	7,672 1,682	220 carcasses pork. 235

STOCK EXPORTED.

JANUARY, 1912.

THE following table shows the numbers and descriptions of stock exported from the Dominion :—

Port of Shipment.	Horses.		Cattle.		Sheep.		Swine.
	To Australia.	To Pacific Islands.	To Pacific Islands.	To Australia.	To Pacific Islands.	To South America.	To Pacific Islands.
Auckland	27	8	54	..	125	..	47
Gisborne .. .. .	..	..	..	..	..	..	..
Napier .. .. .	..	..	..	..	..	..	..
Wellington	159	..	..	..	..	..	..
Lyttelton	26	..	..	20	..	..	..
Dunedin	47	..	..	..	..	..	..
Bluff	35	..	..	..	..	..	..
Totals	294	8	54	20	125	..	47

The following are particulars of the horses shipped: 266 draughts (30 stallions, 147 mares, 87 geldings, 2 colts), 2 half-draughts (1 gelding, 1 filly), 8 thoroughbreds (4 mares, 1 gelding, 1 filly, 2 foals), 14 hackneys (2 stallions, 6 mares, 6 geldings), 6 light horses (3 mares, 3 geldings), Shetland ponies (1 male, 1 female), 1 pony cob, 1 trotting-gelding, 1 donkey stallion, 1 entire colt

PRODUCE IMPORTED.

THE following return, compiled by the Customs Department, shows the total importations into New Zealand during the month of January of agricultural and farm products :—

Item.	Quantity.	Value.
		£
Bran	tons	..
Butter	cwt.	..
Cheese	3 cwt.	14
Chaff	14 tons	56
Fresh fruits, all kinds	1,411,021 lb.	10,496
Barley	centals	..
Oats	2,183 centals	666
Wheat	846 centals	272
Onions	3,892 cwt.	1,870
Pollard and sharps	tons	..
Potatoes	1 ton	9
Seeds, grass and clover	9,524 cwt.	44,220
Total value of imports .. .. .	..	£57,603

STOCK IN QUARANTINE.

THE following stock was received into quarantine during the month of January :—

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
MOTUIHI ISLAND (AUCKLAND).					
1	Spaniel ..	Female ..	Vancouver	E. H. Tuck ..	..
SOMES ISLAND (WELLINGTON).					
1	Holstein calf	Male ..	San Fran- cisco	H. Bayliss ..	Mangatainoka.
3	Southdown ewes	Female ..	Liverpool..	J. Knight ..	Feilding.
1	Ayrshire calf	Male ..	London ..	Department of Agri- culture	Wellington.
6	Ayrshire heifers	Female ..	" ..	Ditto ..	"
3	Shropshire rams	Male ..	" ..	J. G. Wilson ..	Bull's.
4	Romney rams	" ..	" ..	J. R. Mackenzie ..	Clinton.
1	Japanese spaniel	Female ..	" ..	" ..	"
2	Collie dogs ..	Male ..	" ..	" ..	"
1	Collie bitch..	Female ..	" ..	" ..	"
QUAIL ISLAND (LYTTELTON).					
1	Border Leices- ter ram	Male ..	Liverpool..	D. M. Sutherland ..	Waimate.
1	Pug dog ..	" ..	" ..	T. M. Maher ..	Christchurch.
1	Yorkshire ter- rier	" ..	" ..	" ..	"
2	Collie dogs ..	" ..	" ..	James Lilico ..	Invercargill.

GRADING OF CASEIN.

THE Department has been requested to grade casein for export, and has decided to accede to the request. Certificates will be issued as to both quality and weights, as in the case of butter and cheese. No doubt the official grading of casein—for which commodity there is an expanding demand in the manufacturing world—will facilitate the development of this branch of the dairy industry, inasmuch as merchants will naturally be encouraged to deal in a product of which there is an official guarantee of quality.

THE BRITISH PRODUCE-MARKET.

HIGH COMMISSIONER'S CABLED REPORTS.

The Department of Agriculture, Commerce, and Tourists has received the following cablegrams from the High Commissioner for New Zealand. (NOTE.—Quotations, unless otherwise specified, are average market prices on spot.)

London, 20th January, 1912.

Mutton.—The market is quiet. Trade for all classes has been very slow, and prices are barely maintained. Canterbury is not quoted. North Island, 4½d. per lb. (a limited supply).

Lamb.—The market is firmer; there is more demand. New Zealand, 5½d. per lb.

Beef.—The market remains firm; there are signs of improvement. New Zealand hinds 3½d., fores 3d., per lb.

Butter.—The market is quieter; high prices and anticipated labour troubles affect the market; buyers are holding back, expecting prices to go lower. The average price for the week for choicest New Zealand butter is 130s., Australian 127s., Argentine 127s., Danish 134s., Siberian 129s., per cwt.

Cheese.—The market is quiet; prices are slightly weaker. The average price for the week for finest New Zealand cheese is—white 73s., coloured 72s., per cwt.

Hemp.—The market is firm, but quiet at the advance, at last quotations: Spot, New Zealand good-fair £22, fair £21, Manila £22, per ton. Forward shipment: New Zealand good-fair £22, fair £21, Manila £23 per ton. The output from Manila for the week was 24,000 bales.

Wool.—The market shows signs of strength; Americans are buying crossbreds freely.

Hops.—The market shows signs of strength; a small supply; there is a general and active demand. English £13, Californian £12, per cwt.

Kauri-gum.—The market is quiet; a very moderate demand. Dark-brown selected rescraped £5 10s. to £7, dark-brown three-quarter scraped £4 5s. to £4 10s., dark-brown chips, drossy £1 10s. to £1 12s. 6d., rescraped pale amber £11 to £12, three-quarter pale scraped £7, diggers' chips, good, £2 5s. per cwt. 650 cases offered, 200 cases sold. Stock, 31st December, 1911, 381 cases.

London, 27th January, 1912.

Mutton.—The market is quiet; trade in mutton is very disappointing, there being only a very hand-to-mouth demand. Although very limited supply, buyers are not inclined to make forward purchases of mutton at present prices in anticipation of heavy arrivals, but holders are firm. North Island 4½d., Australian 3½d., River Plate 3½d. per lb.

Lamb.—There is a good demand for all lamb. River Plate lambs better quality than last year. New Zealand lamb other than Canterbury average 5½d., Australian 4½d., River Plate 4½d., per lb.

Beef.—The market is very firm, and is affected by decrease in arrivals. New Zealand stock is almost exhausted. New Zealand hinds 4½d., fores 4d., per lb. A small quantity on hand have sold at this price.

Butter.—The market is quiet, but holders are firm, as a moderate supply expected and increasing quantity going to the Continent. The average price for the week for choicest New Zealand butter is 131s., Australian 128s., Argentine 128s., Danish 135s., Siberian 129s., per cwt.

Cheese.—The market is firmer; there is more demand. The average price for the week for finest New Zealand cheese is—white 72s. 6d., coloured 71s. 6d., English cheddar 90s., per cwt.

Hemp.—The market is a shade weaker; very heavy shipments are expected from Manila. Market is dependent on Manila reports. New Zealand good-fair, grade, on

spot, £21 10s., fair grade £20 10s., fair current Manila £21 5s., per ton. Forward shipment: New Zealand good-fair £21 15s., fair £20 15s., fair current Manila £22, per ton. The output from Manila for the week was 31,000 bales.

Wool.—The market for merino is a shade weaker; crossbred market remains firm.

Cocksfoot-seed.—The market is firm.

London, 3rd February, 1912.

Mutton.—The market is steady, but without animation; best quality is scarce, North Island 4½d., Australian 3¼d., River Plate 3½d., per lb.

Lamb.—The market is firm; there is a good demand for prime quality but there is a scarcity of same. Buyers are not inclined to make forward purchases at present prices. Australian 4¾d., River Plate 4¼d., other than Canterbury 5¾d., per lb.

Beef.—The market remains firm; the supply is small, but constant. New Zealand hinds 4½d., fores 4d., per lb. nominal.

Butter.—The market is steady, and likely to remain so. Moderate supplies are coming forward from Denmark and Siberia. The average price for the week for choicest New Zealand is 131s., Australian 128s., Argentine 127s., Danish 135s., Siberian 129s., per cwt.

Cheese.—The market is steady; there is a good demand for all descriptions of white and coloured.

Hemp.—The market is quiet but steady. New Zealand good-fair, spot, £21 10s., fair grade £20 10s., fair current Manila £22, per ton. Forward shipment about the same. The output from Manila for the week was 39,000 bales.

Hops.—The market is firm, owing to reduced supplies. English £13, Californian £12.

London, 10th February, 1912.

Mutton.—The market is quiet, with a tendency in favour of buyers; buyers are not inclined to make forward purchases at present prices. North Island 4d., Australian 3¼d., River Plate 3¾d., per lb.

Lamb.—The market is steady, with a very good demand. Other than Canterbury 5½d., Australian 4¼d., River Plate 4½d., per lb.

Beef.—The market is quiet; quotations for New Zealand are nominal; the prices have slightly declined for all grades.

Butter.—The market is firm, and likely to remain for some time; there is a good demand. The average price for the week for choicest New Zealand butter is 132s., Australian 129s., Argentine 129s., Danish 136s., Siberian 130s., per cwt.

Cheese.—The market is quiet, but firm. White 72s. coloured 71s. 6d., per cwt.

Hemp.—The market is quiet; little doing, but good feeling prevails. New Zealand good-fair grade, spot, £21 5s., New Zealand fair grade, spot, £20 5s., fair current Manila £21 15s., per ton. Forward shipment: New Zealand good-fair £21 10s., New Zealand fair grade £20 10s., fair current Manila £22, per ton. The output from Manila for the week was 33,000 bales. Stock New Zealand hemp, 401 tons.

Wheat.—There is more demand; holders are firm. New Zealand long-berried wheat, spot, ex granary, 37s. 6d., short-berried 37s., per quarter of 496 lb. A small supply.

Oats.—The supply is practically exhausted. New Zealand oats, short sparrow-bills, spot, ex granary, 26s. 6d., per quarter of 384 lb., Danish 23s. per quarter of 320 lb. Quotations are nominal.

Beans.—The market is firm owing to reduced supplies. New Zealand beans, f.a.q., old crop 37s. 6d., per 504 lb.

Peas.—The market is dull; supply exceeds the demand. New Zealand peas, partridge, 39s., per 504 lb.

Cocksfoot-seed.—The market is very firm; there are light stocks on hand. New Zealand cocksfoot-seed weighing 17 lb. per bushel is 75s. per cwt. on spot.

Mutton and Lamb.—River Plate shipments received during January, 1912:—

				Mutton, Carcases.	Lamb, Carcases.
London	..	..	..	107,751	5,291
Liverpool	..	..	..	94,213	44,216
Hull ..	..	..	..	12,349	1,414
Southampton	..	..	..	9,046	9,115
Cardiff	..	..	..	5,511	..
Newcastle	14,000	1,500
				242,870	61,536
January, 1911	221,815	103,677



THE JOURNAL

OF THE

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WELLINGTON, N.Z.,
15TH MAR., 1912.

PRICE,
SIXPENCE.

HAY - MAKING.

PRIMROSE McCONNELL.

THE earlier part of the season just past was exceptionally unsuitable for the hay harvest, being unusually cold and wet. The delay caused by the latter threw hay and corn harvest together, and under such circumstances the best results cannot be obtained, as occasions are sure to arise when choice must be made as to which crop will be secured to the neglect of the other. In order to avoid this as far as possible, when a large area of hay and corn has to be dealt with, the hay-paddocks should be closed early in the season, so that the hay harvest may be commenced at a proportionately early date and completed before the corn is ripe. Even then a continuance of bad weather may upset calculations.

At this station (Ruakura Farm of Instruction) something like 300 tons of hay and a similar weight of oat-sheaves—the greater part in good condition—have been secured. One of the hay-stacks is esti-

mated to contain 75 tons. The average weight per acre I estimate at $2\frac{1}{2}$ tons, a considerable area going up to 3 tons, which is an enormous crop of pasture hay. Basic slag was the only manure used, and it was applied in June. This fertilizer undoubtedly produces the best quality of hay, if not the greatest bulk. Nitrogenous manures increase the ordinary grasses to a greater extent than the clovers, and so lessen the nutritive value of the hay.

Under the old system of working with the scythe, hand-rakes, and forks, the securing of such a quantity of hay was a considerable



THE HAY-TEDDER AT WORK.

undertaking, and meant a great deal of very hard work. The writer is speaking from a fairly lengthy practical experience, and he does not blame the present-day farm hand for fighting shy of the hand-rake and fork and preferring the horse-rake, sweep, and lift. I have pleasure in stating that we possess at this station a first-class up-to-date haymaking outfit, which, with the addition of good weather, makes hay-making comparatively easy work. Our outfit consists of two mowers (a Massey-Harris and a Deering), two horse-rakes, two sweeps, a Blackstone swathe-turner, a Deering tedder, and a Deering hay-lift.

For the farmer a good crop of well secured hay is as good as money in the bank, and, to obtain the best results from his live-stock, is an absolutely necessary investment. It will also free him from considerable anxiety when winter approaches, as well as return him a very big interest.

It can scarcely be credited that every winter in New Zealand, even on farms where hay could be easily secured, a number of cows

die through absolute starvation, while many that pull through do not give enough milk to pay for their keep, on account of their very low condition when commencing their period of lactation. On the other hand, the backblocks dairy-farmer, with a section which has been entirely bush, has a very difficult task in providing any winter feed at all, as haymaking in many instances is almost impossible for some years.

Good hay and a few roots are undoubtedly preferable to hay alone; but a farmer may comfortably face a severe winter and spring with nothing else on hand but a supply of good hay. Roots without hay are indifferent food for a dairy cow, while good hay is a good feed within itself.

The best time to mow is when the grass is coming into flower, and if secured at this stage without rain the quality of the hay will be excellent. After the flowering period the nutritive value of the hay gradually decreases, although the bulk may be much increased. When a large acreage has to be dealt with, however, it is well to make a start even before the grass is in flower, otherwise the later-mown paddocks will become too ripe, which is disastrous in many ways. Overripe hay means the loss of the greater portion of the seed, which



BRINGING THE SWEEPER TO THE HAY-LIFT.

not only has considerable feeding-value, but the ripening of the seed causes a heavier drain on the fertility of the soil, the undergrowth withers, which seriously affects the aftermath, and some of the grasses may die out altogether. The resulting hay contains less nutriment, as much of the latter has been transferred to the seed-pods. The stems of the grasses also become woody, and less easy of digestion.

Hay in perfect condition for stacking contains about 12 per cent. of moisture. The time required for drying the hay previous to stacking will depend on the nature of the herbage and the stage of its growth. The

coarser grasses, such as cocksfoot, timothy, &c., require little drying, and, granted the weather is favourable, may be stacked the second day after cutting.

As long as it contains no rain-moisture there is not much danger of overheating this class of hay. The natural sap causes heating, but when no rain-moisture is present there will be no mouldiness. When the herbage consists principally of clovers much longer fielding is necessary. Clovers may appear to be dry enough for stacking and yet contain sufficient moisture to cause overheating in the stack.



THE LIFT TIPPING ITS LOAD ON TO THE STACK.

A ready way of determining whether too much moisture is present is to take a handful of hay and twist it tightly in the form of a rope; the moisture present will then

be seen exuding from the stems. Practice, however, enables the farmer to tell at once when the hay is in a fit condition for stacking without troubling to test it in this manner.

As a rule, a good crop of mixed grasses and clovers may be mown the one day, turned with the swathe-turner on the afternoon of the following day, allowed to lie untouched the next day, and raked into windrows and stacked the day after. Too much turning of the hay is undesirable, as the less the surface exposed the better will be the quality of the hay. The more the hay is knocked about the greater will be the loss of leafage and seed. A comparatively light crop in good weather requires no turning. As a rule it can be raked into windrows the day after mowing, and stacked the following day.

In New Zealand, where a large area has to be tackled, and all labour hired, risks must be taken, as it will not pay to cock and recock in the old style; and, as a matter of fact, few farm hands can now make a cock that will turn rain.

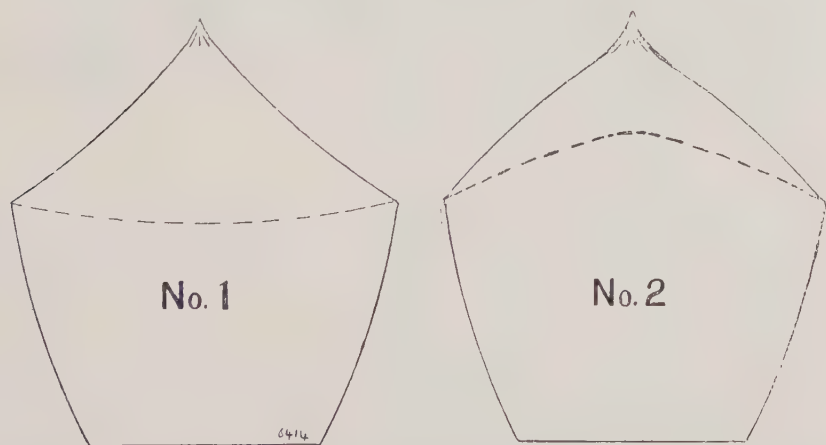
Should wet weather set in immediately after mowing, the swathes are better untouched, at least for some days. When the weather again takes up, the swathe-turner, or the hay-tedder with the back-kicking action, will be found invaluable implements for turning over and lightening up the wet hay. Where the sweeps are not available, the windrows should

be made in pairs, so that there is just room for a cart or wagon between the two, and a forker at each side. It is at this point that the sweeps and lift come in as great labour-savers.

I am aware that many farmers cannot afford a complete up-to-date outfit; but I think in many neighbourhoods it would be possible for a few farmers to join in such a purchase, and by combining both their manual and machine labour a great quantity of hay could be got together in a short time. It is true that such an arrangement would be irksome to many farmers, but in instances where money is temporarily scarce it is a better way out of the difficulty than buying machinery on a long credit at a proportionately high price plus heavy interest.

Stacking hay, when the lift is putting up several hundredweights at a time, is work that requires considerable practice, and a tidy stack is, of course, more difficult to make than when the hay is only going up a forkful at a time. The main point in stacking is to always keep the centre well filled and the ends a little higher than the middle. The whole stack will then settle with a level "easing." A stack which droops at each end never has the same appearance as when the whole is perfectly level. Of course, the shape of a stack is entirely a matter of taste, and, provided the top is made so as to turn rain, a good many faults of shape may be overlooked. The accompanying sketches give my own idea of what is right and what is wrong in shape. They show the cross sections of a long stack.

Before commencing to top out a stack it is absolutely essential that the centre is filled as shown in No. 2 sketch; in fact, it should be half



THESE DIAGRAMS REPRESENT CROSS-SECTIONS THROUGH AN OBLONG STACK. THE DOTTED LINES SHOW THE POSITION OF THE LAST FILLING-IN BEFORE THE TOP IS PUT ON.

topped out, as it were. If the top of a stack is properly made no rain can possibly enter. As each course is added, the sides should be firmly raked down, and beaten with the rake, so as to leave as level and smooth a surface as possible.

I have known well-made stacks stand unthatched all the winter and remain perfectly dry, except perhaps an inch or two on the outside. I am not advising any one to leave their stacks unthatched. My advice is to thatch as soon as possible; at the same time, a better and more permanent job can be made of the thatching after the stack has been allowed a few days to settle.

Some stackers seem to think that if they make a top like an attenuated steeple it is all that is necessary to turn the rain; but, let the top be made any length and steepness the stacker may choose, it will not keep out the rain unless the stack is well filled before the top is commenced. The rain may run off as far as the "easing," but it will there strike the last course of the body of the stack, which is shaped as shown in No. 1 sketch, and the wet must gradually drain right towards the centre. On the other hand, if the centre is well filled, the first course of the top will slope downwards and outwards, and the rain cannot possibly penetrate any distance. This applies even more so to a corn stack.



THE HAY-LIFT IN OPERATION.

Where a large area of hay is made hay-sheds are undoubtedly a great economy in the end, and lifts are now specially made for elevating the hay in sheds—something on the principle of the double-pole Manitoba stack-lift. In Great Britain hay and corn sheds may be seen on almost every farm of any pretension.

All hay is improved by a slight sweat in the stack, as this converts the starchy matter into sugar; but, as previously pointed out, the sweating should arise from the natural sap in the hay, and not from rain-moisture.

Hay improves by keeping, and in England hunting and racing men will not use one-year-old hay if they can get older; and for this purpose it must be free from dust. For hunters and racers good rye-grass hay is the best of all, and for milking-cows clovers or lucerne—the latter for preference. For young stock, green hay made from the finer grasses is the best. For young calves especially the coarse-stemmed grasses are not desirable.

In attempting to give advice on any subject like this, as a practical farmer I am well aware that it is one thing to give advice but quite another thing to carry it out to the letter. In farming-life circumstances often arise which defeat our best-laid plans, and we are often compelled to muddle through as well as we can. It is easy to criticize a neighbour, but the critic should always remember that he does not know his neighbour's circumstances. A modicum of comfort is sometimes conveyed to the farmer in the knowledge that his neighbour makes as big mistakes as himself.

ABNORMAL DEVELOPMENT OF OAT-HEADS.

THE peculiar condition of the oat-heads illustrated cannot be attributed to any specific disease. The leaves subtending the heads apparently stopped their growth just at the time the oats themselves were coming into ear, and the result has been to twist and malform the growth of the stems, they being unable to free themselves from the subtending leaves which encased them. Such a development is not uncommon when, owing to unfavourable weather, the general growth of the crop more or less ceases. It would be interesting to save some of the seed from the abnormal heads to ascertain if this peculiar malformation is hereditary, or if it has been caused merely through unfavourable conditions.—

A. H. Cockayne.



These heads are from a crop of 30 acres on a Waiau farm. At least two stalks out of three are affected. The yield, in consequence, is estimated at less than half of what it otherwise would be.

ROBINIA PSEUDO-ACACIA (LOCUST-TREE, OR FALSE ACACIA).

IS IT INJURIOUS TO STOCK?

B. C. ASTON.

THREE foals having recently died at Hawke's Bay in a paddock in which trees of *Robinia pseudo-acacia* were growing, and the *post mortem* examination disclosing the fact that the leaves of the tree had been eaten, suspicion was aroused that this plant was the cause of the mortality. *Robinia* belongs to the huge family Leguminosae, or the pod- (legume-) bearing plants, to which also belong so many valuable as well as poisonous plants. That *Robinia* may be regarded as an element of danger in proximity to stock may be inferred from the facts that Power (P. Jour., Aug., 1901) found a poisonous nucleoproteid (Robin) and evidences of one or more alkaloids in the bark; that three cases of poisoning of children by the root have been recorded (Ann. Thér. 1860-64); as well as of thirty-two boys from chewing the inner bark of the tree (Emery, N.Y. M. Jour., Jan. 22, 1887). The symptoms in the mildest cases were vomiting and flushed faces, dryness of the throat and mouth, and dilated pupils. In the severest cases, to these were added epigastric pain, extremely feeble intermittent heart-action, and stupor.

As *Robinia pseudo-acacia* is being extensively grown in the North Island, it is extremely desirable to ascertain whether (1) stock will normally eat the plant; if so, (2) whether it will poison them. The writer will be obliged to receive any experiences of farmers and others on the matter.

In the period from 1906 to 1910 the farmers conducting co-operative experiments in the Province of Ontario, Canada, numbered 4,278.

The British Board of Agriculture has just granted twelve research scholarships in agricultural science. The scholarships, which are of the annual value of £150, and are tenable for three years, have been established in order to train promising students, under suitable supervision, with a view to their contributing to the development of agriculture, either by carrying out independent research, or by acting in an advisory capacity to agriculturists.

A L U C E R N E - P E S T .

GENERAL INCREASE OF A HITHERTO RARE WEED.

A. H. COCKAYNE.

THE great extension of lucerne-growing that has taken place during the past season has led to the general establishment of a weed that has been hitherto one of the rarest of our naturalized aliens. This plant, known as *Eruca sativa*, until this year had only been recorded from Port Fitzroy, near Cape Rodney, in the North Island, but during the past few months its presence has been reported as quite general in newly sown lucerne-fields, from Central Otago in the South to Hawera in the North. *Eruca* belongs to the turnip family, and when in flower closely resembles wild radish in appearance. The flowers are light yellow in colour, and the petals are strongly marked with pinkish veins. The pods are oblong, nearly terete, with a long seedless beak. The seed is given by Stebler as a source-indicator of South French seed, and it would appear that the majority of the seed sown last season was of this origin. The plant is an annual, from 2 ft. to 3 ft. in height, and seeds very freely, so that it is liable to persist in localities that are not grazed upon.

CONTROL.

In lucerne-fields, if the first cut takes place before the *Eruca* flowers, it is not likely to be of any great danger; but, as it flowers very early, seeding is not improbable before cutting takes place.

In newly sown lucerne plots *Eruca* should be carefully hand-pulled before flowering. I do not look upon this weed as likely to be serious except in lucerne. In the successful cultivation of this crop cleanliness from weeds during the early period of its establishment is one of the cardinal principles to be observed.

A complete and illustrated description of the weed will appear next month.

In initial tests at Ruakura Farm of Instruction with lucerne the portion of the lucerne paddock which received no lime is showing up very yellow—in fact, the difference can be seen from a distance. The want of lime has had a much worse result than the want of inoculation.

P E A S .

FIELD-PEAS is a fodder for stock which is not appreciated to the extent its undoubted value merits. As a means of providing a balanced ration for draught stock, for sheep and pig fattening, and even for poultry it is a fodder which should occupy a prominent place in farm economy. While the seed gives an important concentrated stock-food, the straw may be also utilized for feeding purposes, while, like all legumes, the crop exhausts the soil to a minor extent while it improves its nitrogen content. Peas present no difficulty in cultivation, and may be easily harvested. Grown on land which may have been fouled by weeds a pea crop is the best of all means of clearing the field and preparing it for subsequent crops. There is herewith illustrated a crop of partridge-peas grown at Moumahaki this season under adverse weather-conditions. The picture speaks eloquently of the condition of the crop. The yield should be at least 40 bushels to the acre. The history of the crop is as follows: The land, which had recently produced a crop of rape, was ploughed, rolled, and harrowed. The seeding was at the rate of 2 bushels to the acre, and the manure employed was $1\frac{1}{2}$ cwt. of superphosphate. Immediately after the seed was sown the land was harrowed and rolled, an established procedure at Moumahaki, as a necessary preventive of the ill effects of unfavourable weather on the light soil of the farm. After the crop was showing above the ground it was again harrowed. The state of the crop at thirteen weeks old, when the accompanying photograph was taken, testifies to the value of thorough cultivation, especially in unfavourable seasons.

Something like 250 tons of hay have been stacked at Ruakura Farm of Instruction this season, and a similar weight of oat-sheaves. The prospect of the mangel crop is very good. An abundance of winter forage is therefore assured.

The experience with maize at Moumahaki Experimental Farm this season has been that common throughout the majority of the districts of the Dominion where this crop is grown: it was a partial failure, owing to the unusually low temperature which has characterized the weather. Soya beans and cow-peas, for the same reason, have been a complete failure, though sown at intervals. At Ruakura Farm of Instruction the experience was very similar in regard to maize, and, while the cold and wet weather checked the Soya bean and cow-pea crops, the former is now making fair progress.



THE PEA CROP AT MOUMAHAKI EXPERIMENTAL FARM.

COW - TESTING NOTES.

W. M. SINGLETON.

THE testing of dairy cows for milk and butter-fat production has extended very considerably this season. The work is appealing to dairymen, and actual experience has convinced our association members that the labour and extra time entailed are not such drawbacks as was feared would be the case.

Besides the two new associations started by the Department this season, a good deal of testing has been commenced independent of the Department's control. Some testing was commenced during the preceding season, but was added to very materially this spring. The total number of cows under test on the association system is now approximately 14,000. This is a splendid beginning, considering that it is only a little over two years since the inception of the first model association at Dalefield.

The work appears to have been very satisfactory to our association members, and we have been pleased to note the appreciation which many members expressed when replying to a circular letter last spring asking whether they desired to continue cow-testing a second season. Some dairymen who are not yet satisfied as to the necessity of cow-testing, and who feel that the work entails trouble not compensated for by the results, may have such doubts dispelled by reading some of the opinions of dairymen who have had practical experience with this work for a season. A dairy-company director having a herd of fifty cows states: "I intend to again take advantage of the Department's services in having my cows tested. It well repays one for the time it takes, and I am sure it is a forward movement in the dairying business."

Some dairymen believe that they can select their cows as well as can the scales and Babcock test. Not so the member who writes as follows: "The results of the testing of my herds has placed me in the position of deciding which cows to keep, which I could not in any other way have done; and I beg to thank your Department for introducing the system into our district. I am very pleased that you intend to continue this work another season, and will be glad if you will test my herd of a hundred cows."

Even fairly large herds do not bar the work when the benefits are duly appreciated, as this testimony shows: "I appreciate the work done by

your Department; it must tend to the betterment of the dairying industry in the Dominion, and in a few years I feel that cow-testing associations will be established in all districts. Please put me down again for seventy-five cows."

Many dairymen are striving to raise the standard of their dairy herds. A member has stated his opinion of the benefits of cow-testing in the following words: "I consider it the best education we can acquire for the development of proper dairy stock." Another member is enthusiastic. His herd is not the best, but he is out to improve it: "I consider it is the greatest boon to the industry as a whole that could possibly be done for us." A dairyman does not wish to return to the old haphazard way when he writes: "I wish to remain a member of your testing association. I think it a great boon to us members. You have paid the greatest attention to the work, and made everything clear and plain in your summing up. Last season we had forty-three cows tested. I think this season we may have about fifty."

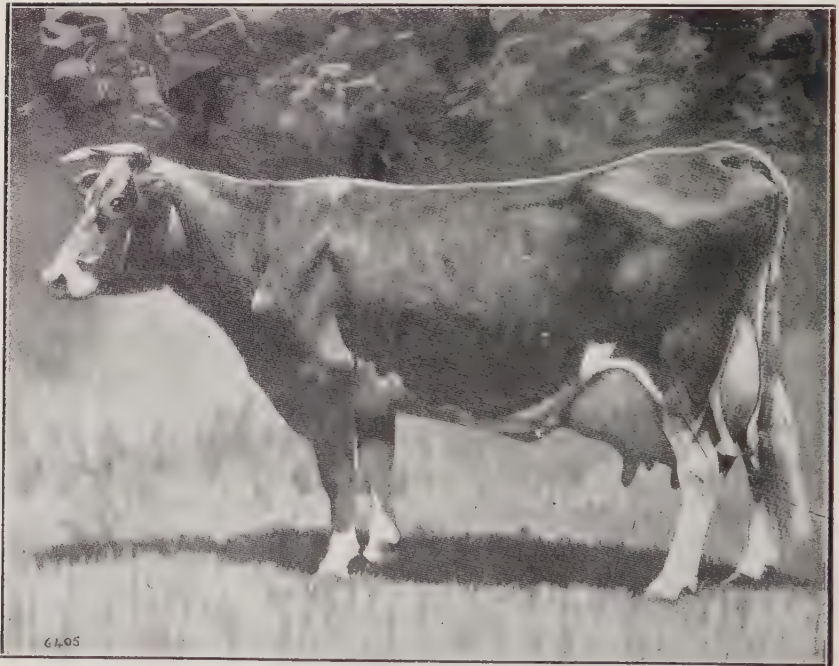
Some dairy-farmers are making good progress; some are not doing so well; but owners of some of the poorer herds are not going to be behind the average always. Last season for the thirty-day period closing in the first week of December the average cow of a member's herd produced 4.19 lb. fat below the average of his association. This season, for the corresponding period, his average is only 0.65 lb. behind the average cow of his association. He has fewer cows this season, and the production of his average cow relative to the yield of the average cow of the association shows that he has culled wisely. Furthermore, he has adopted a construction policy. A study of his cow-testing returns last season convinced him that his heifers sired by a scrub bull and from cows below the average were not a good basis upon which to found a good herd in a short time. Another cow-testing member was selling out. His was a good herd, the yield for the season being considerably above the average for his association; and our friend bought his heifers, and to mate with them he purchased a purebred bull of a distinctive dairy breed. When I visited his herd a year ago, and saw many poor-producing cows in it, the feed so short that even the better cows could not do their best, while at the head of the herd was a scrub bull of the type so frequently seen in a saleyard, it was at once apparent that there was much room for improvement. I suggested culling and giving the better cows better feed, and advised the use of a purebred bull of a dairy breed. The owner has gone one better in the purchase of heifers better than his own for his future herd.

Cow-testing enables the dairyman to get right down to "bed-rock" in herd-improvement. It is the best method of getting a solid foundation; and nothing stable can be built on any other foundation—not even a highly productive dairy herd. When this member wishes to buy his

second purebred bull I expect to hear of his endeavouring to get one which has a dam that has been tested and actually proved to have yielded a highly profitable return for a season. For a purebred bull from an authenticated high-producing dam, he will not be the one to object to an extra few guineas in price. How many breeders, however, will be able to supply him with such a bull?

CALIFORNIAN BUTTER MARKET.

CALIFORNIAN butter-merchants, reports the Trade Commissioner, prefer butter in cube boxes, as the butter on their markets is put up in 1 lb. and 2 lb. blocks, and their cutting-machines are made so as to cut up the exact weight and quantity from the cube blocks without any waste. They have stated that the quality of the New Zealand butter is so good that they can sell it in their own wrappers as the best Californian production. They defend their custom of selling New Zealand butter as Californian by the argument that the consumers would expect to purchase it if sold as New Zealand at cents per pound less than their own product, because they think their own is the best in the world.



AN AMERICAN GUERNSEY.

From "*Hoar's Dairyman*,"]

BUTTER AND CHEESE.

THE QUALITY OF THIS SEASON'S MAKE.

D. CUDDIE.

WITH regard to the quality of the butter coming forward into the grading-stores this season it is satisfactory to be able to report that there has been a noticeable improvement. Many of the factories have continued to send in consignments of high-quality butter, steadily scoring from 93 to 95 points. The different days' makes have shown great uniformity, and the same can be said of the outputs from the different factories. The pasteurization of cream, which has now been generally adopted, is in a large measure responsible for the improvement. Factories that were only turning out a medium-quality butter last year are amongst those now manufacturing some of the best butter in the country. Of course, there are some brands of butter reaching the stores the quality of which is not as good as it should be. The tendency in general, however, is to make butter that will not only grade well but will maintain its keeping quality and reach the market in a sound condition. At the same time, it must be admitted that there have been a few complaints from the London end in regard to inferior quality, but these have applied as a general rule to brands that were adversely reported on at this end, the New Zealand official judgment being borne out by the London grader of the Department. A special effort has been made by many factory-managers this year to avoid overripeness in the cream, which has a decided detrimental effect on the finished product. Where ripening of the cream is carefully controlled, and the cream is pasteurized and then ripened with a clean-flavoured starter, the butter has come under the trier in a satisfactory state, and appears to have carried Home in good order.

While the quality of the butter is a cause for congratulation, that of cheese has also shown considerable improvement. Generally a very good standard of quality is being maintained. Defects in flavour and also in manufacturing details are noticeable here and there, while some of the consignments have exhibited a certain amount of irregularity. However, some very good lines of cheese are coming forward for each fortnightly steamer. As in previous seasons, there has been a considerable amount of openness in the body of some of the cheese, and as this is rather a serious fault in the eyes of the trade—who regard body and texture as of just as much importance as clean flavour—it is essential that makers should do their utmost to ensure a close-cutting, meaty cheese.

MILK - PEDIGREE DAIRY-STOCK.

THE HOLSTEINS AND AYRSHIRES IMPORTED BY THE DEPARTMENT.

E. CLIFTON.

DETAILED particulars, from a milk-producing standpoint, of the Holstein and Ayrshire stock recently imported by the Department are now available.

The Holstein cattle imported from America comprise a bull and three heifers.

The bull, Oak de Kol Homestead Fobes No. 65750, was calved on the 26th April, 1908. His sire, Fobes de Kol, has sixteen of his daughters in the advanced register. His dam, Oak de Kol, has a seven days' test of 29.55 lb. of butter to her credit.

One of the heifers, Jessie Fobes Beets, was calved on the 26th March, 1910. Her sire, Judge Beets Segis, is a son of King Segis, who for his age has the largest number of record daughters. Her dam, Jessie Fobes 6, gave at three years and a half 25.99 lb. of butter in seven days.

The second heifer, Lady Blanche de Kol Homestead, was calved on the 12th March, 1910. Her sire, Homestead Jr. de Kol, has forty-eight daughters in the advanced register. Her dam, Blanche Frisby, has given 19.14 lb. of butter in seven days.

The bull and these two heifers were bred by S. B. Jones and Son, Wisconsin, U.S.A.

A younger heifer, Mutual Mercedes of Rock, was calved on the 3rd October, 1910. Her sire, Mutual Piebe de Kol, is a young bull with a great official backing, claiming many progenitors of great milk-production, including a world's champion. Her dam, Buffalo Queen Mercedes 2nd, produced on semi-official test in nine months 701.60 lb. of butter from 17,189 lb. of milk.

This heifer was bred by Mr. John Hetts, of Wisconsin.

It will be noted that the bull and heifers are descended from the famous de Kol family. They thus come along on the line of the bull hitherto in use at Weraroa, Sir de Kol Inka Pietertje. This bull is described as a sire that combines the blood of the largest producing families known to the breed—viz., Netherlands de Kol, Hengerveldg,

Pietertje, Mooies, and Inkas. This is fortunate, as the risk of the complete outcross is avoided; therefore, by maintaining the line the greatest results from the prepotency of a famous family of milk-producing cows should be secured for the Weraroa herd of Holsteins.

AYRSHIRES.

The importation of this stock comprises a bull and six heifers. These were selected by Mr. Dunlop, one of the Commission of Scottish farmers who travelled through the Commonwealth, and who extended his journey to this Dominion.

The selection was wholly made for stock of strong constitution, trueness to type, and high milk-production. The stock appear to conform in very great measure to these requirements. The Ayrshire stock of the Dominion should benefit by the importation of these utility types of the breed. It will be probably said by some that these are not altogether show-yard stock. This may be; but it is the Ayrshire of constitution, type, and productive capacity that is required.

These cattle will be located at Moumahaki. It is anticipated the Ayrshire herd at that farm will become as well appreciated to the dairy-farmer as the Holsteins at Weraroa. There is a greater difficulty to overcome in obtaining general recognition of the Ayrshire than in the case of the Holstein. The latter had not been greatly availed of in New Zealand until Weraroa demonstrated the value of this milking-stock of old repute; with the Ayrshire, the favourite of the farmer of North Britain, the show-yard has dealt cruelly. Stock of this breed are not sought for by milk-producers.

The demand for quality has led to the small weedy animal with a well-formed, but, however absurd it may be, an almost teatless udder. It remains to but a few owners and to the Department to reinstate the Ayrshire in the esteem of the dairy-farmer, and the State can be well satisfied that the importation of this utility type of cattle will assure the early appreciation of the Ayrshire stock of the Dominion.

The following particulars of the stock, from a milk-record viewpoint, have been supplied by Mr. Dunlop:—

The heifer Parkhead Dewdrop is out of a cow which won the competition at Fenwick this year for the best cow and the best milker combined. In this competition twenty-three of the best cows in the district were entered. For her appearance she received almost full points, while her milk-yield after being eighteen weeks calved was 55 lb. of milk per day of 3.3 per cent. B.F. Her record as a five-year-old cow last year was 949 gallons at 3.5 per cent. B.F. in forty-four weeks, and she promises to exceed that this year.

Fenwick Maggie has also an exceptionally good dam. This year she calved on the 3rd May, and at the 1st October she had given an average of 44 lb. of milk per day at 3·6 per cent. B.F.

Fenwick Cherry belongs to one of the milkiest strains of the lot. Her dam as a four-year-old has a record of nearly 1,000 gallons, while her sire was bred by me at Midland, as was also her grandsire, from two of the deepest milking strains I ever possessed.

East Newton Beauty is bred on similar lines to Fenwick Cherry. Her dam was bought last year at about seventy guineas by Mr. Tom Clement, who has been trying to purchase all the highest-record cows in the country. As a two-and-a-half-year-old heifer she was giving up to 5 gallons of milk per day, and her record as a four-year-old this year is expected to finish about 1,000 gallons.

Dalmusternock White Blair's dam was also bought at a very high price for Mr. Tom Clement's herd. She is a cow of exceptional merit, and her record is over 900 gallons of about 4 per cent. B.F.

Langdyke Sally I expect will be regarded in New Zealand as the best heifer of the lot. Her dam's record is 975 gallons, but her B.F. at 3·3 per cent. is not quite so high as the others. Her uterine sister won the Fenwick show as a three-year-old heifer this year, and was purchased at a very high figure on behalf of an American millionaire. The exporter, who has sent Ayrshire to all parts of the world, declared that she was the best Ayrshire animal he ever possessed. Her sister, you will see, is equally promising.

The bull, Netherton Good Bonus, is out of an exceptionally fine three-year-old heifer. Her record is not yet finished, but she has already given over 700 gallons of 4·5 per cent. B.F. Her dam is also an exceptional milker on a high-lying farm. She has for a long number of years given about 900 gallons of milk per annum of from 4 to 4·5 per cent. B.F. The champion bull of America, Netherhall Milkman, and many other noted animals are grandsons. His sire, Good Gift, is regarded as one of the best sires in the country, his dam having a record of 1,034 gallons of 3·5 per cent. B.F.

The fact that the attempt to establish lucerne on one of the most unsuitable paddocks of the Ruakura Farm of Instruction has had some measure of success ought to stimulate interest in this, the greatest of all forage plants. In December a small area in the poultry yard was sown with Hunter River lucerne. Extra pains were taken with the preparatory cultivation of this plot, and the result is excellent. It is now the healthiest plot of lucerne I have ever seen; in fact, as far as the eye can judge, it is absolutely free from disease of any kind. The conspicuous success of this plot is another proof of the necessity of thorough cultivation.—*Primrose McConnell.*

NEW ZEALAND DAIRY-PRODUCE.

THE LONDON INSPECTION SERVICE.

THE reports being received from the officer in charge of the official inspection of dairy-produce on the Home markets, Mr. W. Wright, continue to be of a very instructive nature. Necessarily, Mr. Wright's work deals mainly with the quality and condition of New Zealand dairy-produce as it reaches the London market; consequently, the bulk of his reports, which are made weekly and are of a very complete description, deal principally with matters which concern the dairying service of the Department and the individual factory. Such reports are necessarily more or less of a confidential nature, and are not of general interest to the dairying community. They are, however, of great importance to the graders at this end, while the information thus made available to the factories concerned could not otherwise be obtained. Such reports mean that the dairy companies of the Dominion have now not only expert judgment on the quality of their produce before it leaves the Dominion, but they have the opinion of a New Zealand expert on the condition in which it reaches the Home market. Of course it is not possible for the London officer to inspect each brand of butter or cheese as it reaches Britain, but where complaints are made by the trade and where the quality of the produce coming under the grader's notice is found to be unsatisfactory he is in a position to report authoritatively on it. At the same time, he exercises some supervision on the manner in which our butter and cheese is handled on the market. There are also many points of special interest to New Zealand butter and cheese makers which come under his notice, and these are passed on by the Dairy Produce Division to the directorates of the dairy companies concerned. Much information which has gone forward to the factories through this channel has been appreciated. The factory directors realize that the information is from an unbiassed source and that it can be relied upon.

BETTER LANDING-CONDITIONS REQUIRED.

As showing the interest taken by the shipping companies concerned in the New Zealand dairy-produce trade, Mr. Wright reports that a steamer which arrived in the Thames just before Christmas worked its dairy-produce cargo day and night in order to meet the Christmas trade. Unfortunately, there was a steady rain falling during the unloading operations,

with the result that a good many of the boxes and crates became soiled. The provision for the protection of dairy-produce while discharging during unfavourable weather is quite inadequate, and an endeavour is to be made to bring about the needed reform.

CAERPHILLY CHEESE.

From information received by the Home officer it appears that there is a good market for Caerphilly cheese in Wales from the beginning of October to the end of February, when this cheese is sold on an average of 7s. 6d. per hundredweight more than cheddar. One firm the officer has been in communication with could handle at least five hundred crates of Caerphilly cheese in a fortnight. These cheese are packed in crates similar to our own, but they are, of course, smaller, there being four cheese in each crate. Each cheese is wrapped in grease-proof paper, and Mr. Wright suggests that should the trade be taken up by New Zealand cheese-makers it would be well to place a thin dividing-board between the cheese that are not separated by the centre board. In order to determine as to whether Caerphilly cheese made in New Zealand will carry well to the Home market, a specimen cheese was purchased in London and sent out to the Dominion. This has reached Wellington in first-class condition. It has been shown to a number of men interested in the dairy-produce trade, all of whom expressed the opinion that it was of excellent quality. This cheese was especially packed for transit in desiccated cork and in a tin box. It was brought out in a small cool-chamber standing at a similar temperature to that of the cool-chambers in which New Zealand cheddar is usually shipped to the Home market.

It is intended to endeavour to induce several dairy companies to make small shipments of Caerphilly cheese at the suitable period. In this connection it is fortunate that the Department has an expert in Miss G. Nest Davies, who thoroughly understands the manufacture of this special cheese. If well made and marketed at the right time the profit should be such as to amply warrant the departure.

AN ADVERTISING MATTER.

It has now become quite a common thing in New Zealand for dairy companies to place a printed parchment sheet on the top of their butter-boxes with a view to adding to the finish of the boxes and at the same time to intimate to the ultimate purchaser that the butter is made from pasteurized cream and manufactured practically on the Danish system. In some cases the word "Danish" is included in large type at the top and bottom of the circular—in fact, the sheet is really more an advertisement for Danish than for New Zealand butter. Dairy companies would be well advised to discourage such a doubtful method of building up a

reputation. Now that we are making a high-class article quite equal to the Danish, we should endeavour to build up a reputation on our own merits. Such a manner of advertising as that described is calculated to do more harm than good, as it practically declares that New Zealand butter is an imitation of the Danish article. Referring to this subject Mr. Wright reports that the general expression of opinion on this matter of advertising is that it is a bad move on the part of New Zealand. While emulation is the sincerest form of flattery, "I am," he says, "convinced that it would be well to delete the word 'Danish' from all our circulars." In a specimen advertising-sheet sent out by Mr. Wright the word "Danish" occurs in two places and the type employed is by far the most conspicuous in the advertisement. The word "New Zealand" appears only once, and then is only about one-fourth of the size of the word "Danish."

URUGUAY.

URUGUAY has set aside \$216,000 for prizes to be awarded to sheep-farmers who have done most to improve their stock. Not only are the stock-raisers of the country encouraged by these prizes, but there are also some compulsory laws with regard to agricultural interests in general. For example, all range-owners are required to plant five trees per hectare (2.471 acres) and to plant 1 per cent. of their ranges to forage crops. Failure to comply with this law is punished by a fine equal to one-fourth of the land-tax for which this land is assessed. There will also be a prize competition for tree-planting and for cultivated forest crops. There are no forests in Uruguay. Firewood is scarce, and generally is supplied by the bushes which grow along the river-banks. All trees for planting purposes are imported from abroad.—*Spokesman Review*.

"The new agriculture is indeed a new thing for this country. It is not very long ago that farming was looked upon as a drudgery, that it was only by hard manual labour that a man was expected to succeed. . . . All that has changed, and to-day the man who succeeds is the man who uses his brains on the good farm."—*Hon. Sydney Fisher, Canadian Minister of Agriculture*.

Turnips sown in October at Ruakura are a great success. They are now quite ready for consumption. The varieties are Green-top Perfection and Red Paragon. The former is an early white turnip, as is the latter, which has also a high feeding-value. Any one who prefers this crop to rape for early sheep-feed can undoubtedly have the crop matured by the end of January, and fed off before there is any danger of blight. I feel sure (remarks the manager) that much good may be done by urging farmers to sow the hardier forage-crops much earlier in the season, or even in the autumn.

SILVER-BEET.

INTERESTING EXPERIENCE AT MOUMAHAKI.

A SOMEWHAT extensive experiment, to test silver-beet as a fodder for cattle and sheep, is being carried out this season at the Moumahaki Experimental Farm.

Sheep have taken well to the beet; and fed off to cows it has proved just as palatable to these as it has to sheep. Indications point to it proving a useful milk-producing food.

The Moumahaki crop was planted in well-worked soil broken out of old pasture by a digge-plough, the roller and disc following the breaking-up process. It was seeded in drills, 26 in. apart, at the rate of 4 lb. to the acre. A portion of the crop was afterwards singled by the hoe, the plants being left 1 ft. apart. The whole of the crop was cultivated with a triple cultivator until the crop was too dense to work the machine. The crop is not a particularly heavy one—about 15 tons to the acre—but the season has been all against prolific growth.

Silver-beet is more of a dry-weather plant, and this season a succession of storms, accompanied at times by hail and cold winds, were experienced during its growth. A distinct advantage of silver-beet, so far as Moumahaki experience goes, is that it is apparently immune to blight. It is essentially a cut-and-come-again forage-plant, and makes good growth in the winter, frosts having little or no effect on the established plant. It is contended that properly managed silver-beet will provide a constant supply of forage. Just now the experiments with this plant at Moumahaki are practically only in their initial stages. For instance, it has yet to be proved how much feed it will actually provide from season to season, under careful cutting, and when not allowed to be too closely grazed by stock.

Further experiments will be required before farmers can be recommended to avail themselves of this plant as a general farm crop. In pursuance of this, the giant variety, the German lucullus, is to be planted on a large scale at Moumahaki, so that the practical value of this for stock feeding may be ascertained.

A considerable area of the root and forage crops at the Ruakura Farm of Instruction have been horse-hoed seven times this season. The wet weather early in the season, and the prolific growth of weeds in consequence, necessitated the extra hoeing.



LETTUCE PLANT AT MOUMAHAKI EXPERIMENTAL FARM.

LUCERNE.

TESTS AT WERAROA EXPERIMENTAL FARM.

SOME experiments are in progress at Weraroa Experimental Farm to test the suitability of the environment for the cultivation of lucerne, as well as to discover the best variety of the plant to grow. Already facts have been demonstrated. It has been conclusively proved, for one thing, that an ideal seed-bed can be provided in the locality, while there is nothing in the climate to retard a vigorous development and a consequent heavy production. The first cutting from the testing-plots—a cutting which is usually not of sufficient luxuriance of growth to justify its use for hay, being allowed to remain on the ground as a mulch—was of remarkable growth, a heavy mass of vegetation fully 3 ft. in height being produced in fifty days from sowing. The accompanying picture is of the second growth, twenty-one days from cutting.

The method of establishing the lucerne was as follows: The lea paddock had been down in grass for six years. Stable manure, at the rate of 6 tons per acre, was spread on the surface before ploughing. It was skim-ploughed in May and ploughed again in July. 2 cwt. of basic slag per acre was then disced in. It was ploughed for the third time in October. On account of the ground being too wet sowing was delayed until the 24th of November.

Eight varieties were sown broadcast—French, American, Peruvian, Colonial, Arabian, Turkestan, Hungarian, Hunter River. The whole of these germinated very satisfactorily, with the exception of Hunter River.

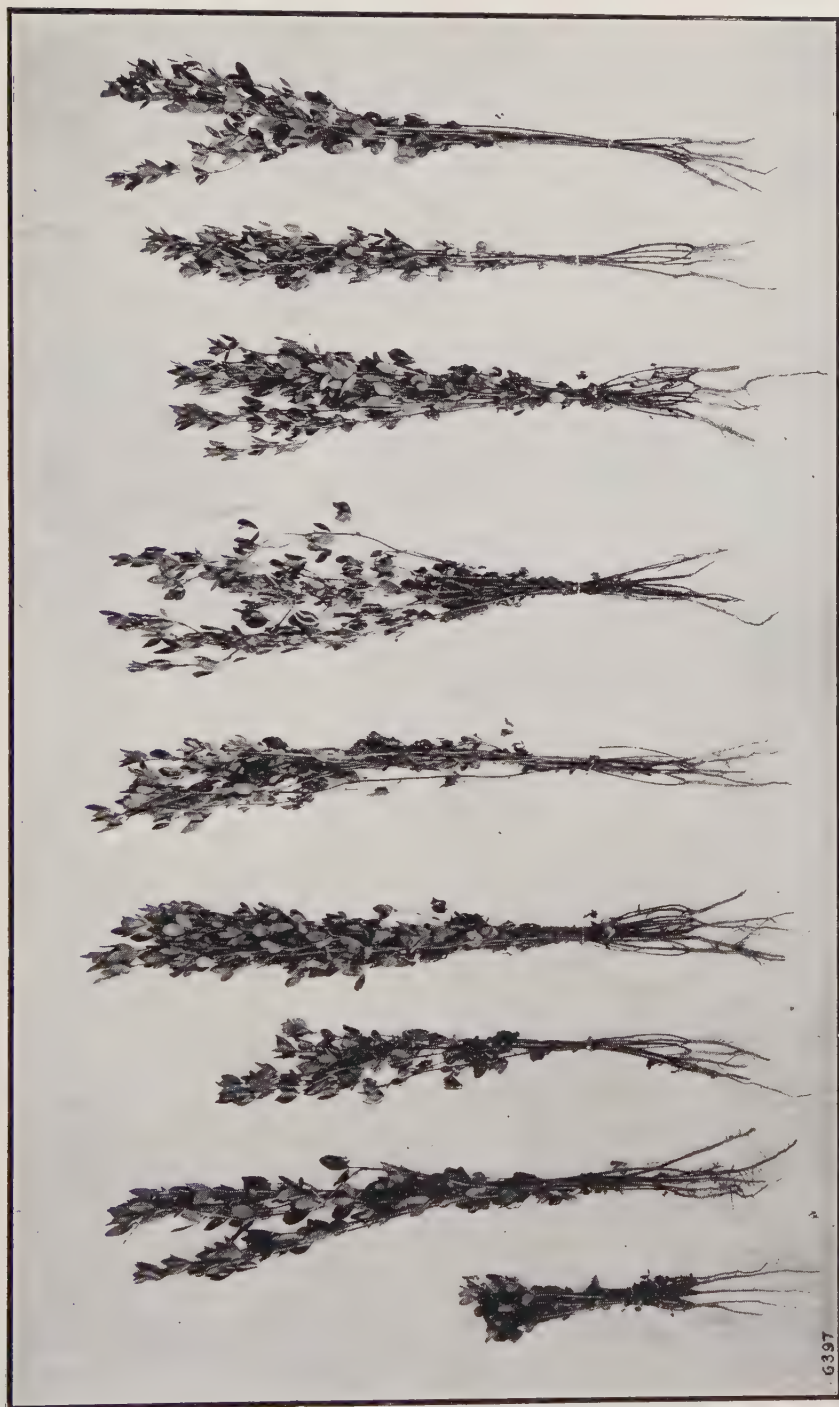
French: This made the most rapid growth. It was cut just before coming into flower, and was fed to dairy herd in fifty days from sowing.

American: The leaf is longer and narrower than that of the French variety.

Peruvian: Similar to the American, but the leaves are slightly smaller and are more pointed; while it is not quite so tall it stooled out better.

Colonial: The proportion of leaf to stem is better than that of any of the other varieties.

Arabian: Slower in growth, but there is a fair proportion of leaf to stem.



AMERICAN.

FRENCH.

ARABIAN.

TURKESTAN.

COLONIAL.

HUNGARIAN

HUNTER
RIVER.

PERUVIAN.

FRENCH.
(Second cut, 21 days.)

6397

Turkestan: The habit of growth is an objection, the stem being procumbent.

Hungarian: Upright habit of growth, with a large number of stems.

Hunter River: The germination, as mentioned, is poor and the growth was slow, with the result that it became badly choked with weeds.

The best of these varieties for the locality cannot be determined from the first season's experience. The plants must be acclimatized and be tested under extremes of climatic conditions.



SECOND LUCERNE GROWTH AT WERAROA. TWENTY-ONE DAYS FROM CUTTING.

A FEILDING TEST.

In a test being carried out by Mr. James Knight, of Feilding, with several varieties of lucerne, Provence has made much the strongest growth. Little difference is so far discernable between Peruvian, Arabian, and Turkestan. A portion of the land was limed. The difference between the lucerne in the limed and the unlimed portions is most striking. The liming was at the rate of 8 cwt. to the acre. The seed was drilled—the drills being 7 in. apart—at the rate of 14 lb. to the acre. The plots received a manurial dressing of $1\frac{1}{2}$ cwt. of superphosphate, 40 lb. of bonemeal, 20 lb. of sulphate of potash, and 10 lb. of sulphate of ammonia. The seed was produced in the South Island.

Perhaps the forage soiling crop which promises the best results in the future, reports Mr. Primrose McConnell, from Ruakura, is a mixture of peas and millet or peas and maize. These are well-balanced foodstuffs, and should leave the land in better condition than when the maize and millets are grown alone. These mixtures are to be tested at Ruakura for milk-production.

CO-OPERATIVE EXPERIMENTS.

NORTH ISLAND INVESTIGATORS.

THE following farmers are co-operating with the Department in the North Island in conducting experiments in connection with farm crops, comprising both variety and manurial tests. Doubtless any of these experimenters will be pleased to allow neighbouring farmers to inspect the plots and will assuredly provide them with the information desired as to varieties tested, manures tried, and cultural methods adopted. It is expected such inspection will induce concurrence in this important investigation campaign, and may be such visits will have a mutual beneficial effect by reason of suggestions being thereby prompted in regard to further experiments in directions which will extend the benefits of co-operative experimental work.

MANAWATU AND RANGITIKEI.

- Harrison, T., Ashhurst : Lucerne (2), helianthi, maize for seed.
 Stephens, B., Ashhurst : Lucerne (3).
 Marshall, G. L., Bull's : Peas varieties (2), peas manurial (2), swedes on top-dressed pastures (2), lucerne.
 Gibson, R. L., Bonny Glen : Crimson clover on wheat.
 Knight, J., Feilding : Lucerne (5), helianthi.
 Booth, H., Feilding : Peas varieties (2), lucerne.
 Buchanan, A., Palmerston North : Maize varieties (4), kale and rape varieties (6), kale (1), mangels varieties (4).
 Warriner, R., Greatford : Crimson clover on wheat, wheat (3).
 Nordell, M., Pahautanui : Maize varieties (2), peas varieties (2), oats manurial.
 McRae, F. S., Palmerston North : Soya beans (2), cow-peas (2), velvet beans.
 Balsillie, J., Kairanga : Maize for seed, peas varieties (2), lucerne (2), sainfoin, mangels varieties (4), Kudzu vine, Soya beans.
 McKenzie, W., Palmerston North : Lucerne (2), mangels varieties (4).
 Wilson Bros., Glen Oroua : Lucerne varieties (2).
 Moar, S., Pohangina : Lucerne (2).
 Lancaster, S., Palmerston North : Maize varieties (3), mangels varieties (4), mangels manurial (4).
 Davies, J., Marton : Maize (3), sorghum.
 Langkilde, C., Tiakitahuna : Maize for seed, Kudzu vine.
 Thorne, A., Levin : Helianthi, lucerne (6).
 Bennett, H. W., Apiti : Soya beans, silver-beet (2).
 Lane, J. C., Palmerston North : Maize varieties, kale (2).
 Dearlove, J. A., Stoney Creek : Mangels varieties (6).
 McLeavey, J. A., Palmerston North : Lucerne (6).
 Wilson, J. G., Marton : Maize (9), sorghum, millet.
 Hunt, H. H., Rongotea : Lucerne (4).
 Ellis, W. A., Marton : Lucerne (8).
 Stretton, W., Feilding : Lucerne (3).
 Fowler, H. J., Marton : Wheat.
 Birch, W. J., Marton : Wheat.
 London, W. T., Kimbolton : Oats (6).
 Masters, T., Sanson : Oats, wheat.

Gifford, T., Rongotea : Wheat (4).
 Perrett, H., Sanson : Wheat, barley.
 Fraser, D., Bull's : Wheat.
 Hartley, G., Makowhai : Red clover.
 Marton Junction Plot : Temporary pasture, helianthi, oats varieties (4), wheat varieties (13), barley varieties (5), velvet beans, Soya beans (2), mixed forage (3), beet (3), kale (5), peas, grass varieties (12), turnip varieties (5).
Summary for District.—Lucerne (50), maize varieties (22), maize for seed (3), sorghum (2), peas manurial (2), peas varieties (9), cow-peas (2), oats manurial (2), oats varieties (11), swedes on top-dressed pastures (2), mangels manurial (4), mangels varieties (22), wheat varieties (25), red clover, crimson clover on wheat (2), kale (8), beet (3), silver-beet (2), kale and rape (6), sainfoin, mixed forage (3), temporary pasture, helianthi (4), Soya beans (6), barley (6), Kudzu vine (2), velvet beans (2), millet, grass varieties (12), turnip varieties (5) : total, 221.

WAIRARAPA.

Morris, B., Eketahuna : Roots in preparation for lucerne (2).
 Davidson, N. C., Eketahuna : Roots in preparation for lucerne, maize varieties.
 Hunter, J., Masterton : Lucerne (3), peas varieties (2), peas manurial (2).
 Cameron, W., Masterton : Lucerne (3), oats.
 Blundell, J. L., Masterton : Lucerne (3).
 Compton, J., Masterton : Maize varieties (4).
 Perry, W. H., Masterton : Maize varieties.
 Percy Bros., Masterton : Maize for sheep-feed, peas manurial (2), maize and kale, crimson clover on wheat, mangels varieties (4).
 Dagg, R. J., Masterton : Maize for sheep-feed (2), helianthi.
 Harper, E., Masterton : Peas manurial (2), maize and kale.
 Evans, H., Masterton : Maize and kale.
 Wilton, F. R., Masterton : Peas for fodder (2), maize varieties (2).
 Creswell, F., Ballance : Peas manurial (2), maize varieties (4).
 Miller, W., Masterton : Mangels varieties, oats (2).
 Kelstrup, J. A., Masterton : Mangels varieties (4).
 Shaw, F., Masterton : Mangels varieties (4).
 Cave, H., Newman : Mangels varieties (2).
 Taylor, W. J., Pahiatua : Lucerne (4).
 Matthews, H. H., Featherston : Sainfoin.
 O'Neale, A. E., Featherston : Lucerne (4).
 Foster, W. J., Ballance : Beets (2), kale, maize (2), oats (4), barley (4).
 Lett, W. S., Masterton : Peas in preparation for lucerne, mangels in preparation for lucerne.

Summary for District.—Peas manurial (8), peas varieties (2), peas for fodder (2), oats varieties (7), mangels varieties (15), maize varieties (14), maize for sheep-feed (3), maize and kale (3), crimson clover on wheat, kale, beet (2), sainfoin, roots in preparation for lucerne (5), lucerne (17), helianthi, barley (4) : total, 86.

HAWKE'S BAY.

Pilcher, W. E., Raumati : Lucerne, maize varieties (2).
 Johnson, D., Dannevirke : Lucerne, peas manurial (2).
 Armstrong, J., Dannevirke : Temporary pasture.
 Chambers, B., Havelock North : Helianthi, potatoes manurial (3), Soya beans (2), oats manurial (3), grass varieties (26).
 Willan, R. J., Umutaoroa : Maize varieties (2).
 Feierabend, A., Dannevirke : Maize (4), beet, kale.
 Allan and Campbell, Taradale : Maize varieties (4), maize manurial (2).
 Waugh, J., Mangatoro : Maize varieties (4).
 Rich, J., Havelock North : Lucerne (3), maize (2).
 Badland, B., Hastings : Lucerne (4).
 Wilson, R., Jun., Hastings : Lucerne (4).
 Walker, S., Raumati : Lucerne (4).
 Hull, G. B., Takapau : Lucerne (4).
 Bryant, W., Woodville : Lucerne (8).
 Bramley, W., Eskdale : Grass mixtures (2), grass varieties (4).
 Guthrie-Smith, W., Petane : Grass varieties (46).
 McLean, R. D., Maraekakaho : Grass varieties (34).

Summary for District.—Peas manurial (2), oats manurial (3), maize manurial (2), maize varieties (18), grass varieties (110), grass mixtures (2), kale, beet, lucerne (29), helianthi, Soya beans (2), potatoes manurial (3), temporary pasture : total, 175.

TARANAKI.

- Vouilaire, H., Eltham : Lucerne (3).
 Clark, C., Riverlea : Lucerne (3), mixed forage, swedes in preparation for lucerne.
 Valentine, H. J., Eltham : Lucerne (2).
 Symes, A., Riverlea : Temporary pasture (2).
 Solley, C., Riverlea : Maize (2).
 Johns, H., Riverlea : Temporary pasture (2), mangels (4).
 Potts, G., Montosa : Maize varieties (4), peas.
 Were, J., Normanby : Lucerne (3), mangels varieties (3).
 Willis, D. J., Hawera : Lucerne (3).
 Arundell, W., Patea : Mixed forage (2), peas varieties (2), sweet corn (2), chou moellier, kale, cabbage, kohl rabi, carrots (5), Soya beans, silver-beet, cow-peas, mangels (5), potatoes (5).
 Oliver, A., Hawera : Mangels varieties (4), carrots (4).
 Graham, J. H., Eltham : Mangels varieties (6).
 Conaglen, A., Hawera : Mangels varieties (4).
 Budge, C. A., Hawera : Carrots varieties (6), maize manurial (5).
 Marfell, E., Toko : Mangels varieties (4).
 Dunlop, F., Hawera : Lucerne (4).
 Parsons, N. J., Pukearuhe : Lucerne (4).
 Amos, C., Ball Road : Lucerne (2).
 Fincham, E., Toko : Maize varieties (4).
 Were, W. H., Toko : Maize manurial (4).
 Gray, W., Okato : Millet (3).
 Hawkins, T., New Plymouth : Maize varieties (2).
 Connett, J. S., New Plymouth : Maize varieties (6).
 Barleyman, J. B., Waitara : Lucerne.
 Tarrant, L. K., Ngaere : Lucerne (2).
 Gane, F., Normanby : Maize varieties (4).
 Freeth, W. J., Urenui : Lucerne (4), Soya beans (2).
 Long and Hovey, Mahoe : Maize varieties (2), kale (2), carrots (2), mangels.
 Willis, G., Hawera : Maize varieties (2).
 Linn, R. J., Normanby : Kale (2), mangels varieties (4).
 Buxton, H., Auroa : Lucerne (4).
 Blackburne Bros., Inglewood : Lucerne (4).
 Schultze, H., Ball Road : Lucerne (8).
 Beedie, J., Toko : Mangels manurial (4).
 Mundt, W. T., Toko : Mangels manurial (4).
 Cliff, A., New Plymouth : Mangels varieties (12).
 Kilpatrick, R., Inglewood : Mangels varieties (4), carrots (4).
 Longstaff, B. S., New Plymouth : Mangels varieties (6).
 Stanley, W., New Plymouth : Carrots in preparation for lucerne (3).

Summary for District.—Roots in preparation for lucerne (4), maize varieties (26), maize manurial (9), lucerne (47), peas varieties (3), mixed forage (3), mangels manurial (8), mangels varieties (57), temporary pasture (4), kale (5), chou moellier, millet (3), Soya beans (3), cow-peas, potatoes (5), silver-beet, sweet corn (2), cabbage, kohl rabi, carrots (21) : total, 205.

KING-COUNTRY.

- Seth-Smith, W., Ohakune : Chou moellier.
 Lowe, W. H., Otorohanga : Mangels manurial (2), lucerne (4).

AUCKLAND.

- Urquhart, R., Karaka : Peas (2), oats manurial (10).
 Pye, W., Auckland : Grass varieties (8), maize varieties (4), grass-renovation (2).
 Ohlsen, N., Te Hirua : Millet.
 Wilson Bros., Northern Wairoa : Soya beans.
 Fletcher, Rev. H., Taupo : Helianthi, lucerne, agrostis.
 Vaile, E. E., Waiotapu : Kudzu vine, *Lotus hispidus*, helianthi.
 Anderson, A., Piriaka : Lucerne (3).

Murray and Sons, Opotiki : Lucerne.

Brewster, S., Henderson : Peas varieties (2), beans varieties (2), clover varieties.

Steele, J., Bay of Islands : Beet and kale (4), Soya beans.

Watson, A. R., Auckland : Pumpkins.

Muir, J. D., Auckland : Sweet corn (2), pumpkins (2), beans.

Butler, J. M., Opotiki : Lucerne.

Boucher, P., Kumeu : Grass varieties (16), clover varieties (4), grass-seeding (4).

Summary for District.—Peas varieties (4), oats manurial (10), maize varieties (4), millet, wheat varieties (2), grass varieties (24), grass-renovation (2), grass-seeding (8), clover varieties (5), beet and kale (4), lucerne (6), helianthi (2), Soya beans (2), sweet corn (2), beans (3), pumpkins (3), Kudzu vine, *Lotus hispidus* : total, 80.

THE HOP MARKET.

THIS year has opened with a good trade in hops, reports the High Commissioner under date of London, 12th January. Prices that early in the season showed considerable increase on those ruling twelve months previously have been steadily advancing. At the present moment stocks are reported to be in small compass, and prices are very firm. The long, unusually hot summer, while restricting the quantity, helped the quality, which, being exceptionally fine, caused a keen demand amongst brewers to secure parcels. The result is that now there are very few, if any, hops held in growers' hands, and those who possess any stocks are asking a very high figure for them.

The prospect for a continuance of high price is good. If there are good crops in New Zealand and any surplus is available after local requirements are satisfied, this season might be considered a good one in which to make shipments to London. Values at present are quoted in London at £12 per cwt. for English hops, and about £11 for Californian, or about 50 per cent. higher than the prices realized last year.

It is estimated that Victoria (Australia) alone will ship this season 219,000 cases of fruit to London, and about 95,000 cases to Germany. The complete estimates for the rest of Australia are not yet available. The total number of cases exported from the Commonwealth will, it is confidently estimated, be between 1,400,000 and 1,500,000 for the season.—*T. W. Kirk.*

The Bhuda kale, cow-kale, rape, and thousand-headed kale (the first crops on very poor, newly drained swamp at Ruakura) promise well. The recent dry weather showed the comparative drought-resisting qualities of these four forage-plants. In descending order they stand as follows: Thousand-headed kale, cow-kale, rape, Bhuda kale. The thousand-headed kale, although sown in the driest part of the paddock, has not shown the slightest sign of wilting, even in the hottest part of the day; while the Bhuda kale, sown in the dampest portion, showed signs of much distress. This result confirms the manager's previous experience at Moumahaki Experimental Farm. If the thousand-headed kale had the feeding-value of rape it would undoubtedly (in Mr. McConnell's opinion) be the most valuable fodder-plant of this class we possess.

CHEAP FEEDING-TROUGH.

THE feeding-trough illustrated is in use at the Waerenga Experimental Farm. It will appeal to the farmer by reason of its cheapness, lightness, and the ease with which it can be cleaned. As will be seen, the trough proper is made of galvanized corrugated iron, an old sheet of which will serve the purpose admirably. For cleansing purposes a quarter of an inch space is left between the bottom and the end pieces, a slight tilting thus enabling any accumulated water being run out. The framework may be constructed of any rough 2 in. by 1 in. timber, and the timber should be well tarred. This simple trough is very light, and one man can easily put it on a dray or move it about. The long side pieces on to which the iron of the trough is nailed may stand a little up from the framework, so that when the arrangement is turned upside down these side pieces will act as runners and thereby enable the trough to be easily pulled along. The illustration will show how the trough is constructed.



FROZEN MEAT.

SWITZERLAND FACILITATES IMPORTATIONS AND REDUCES DUTY.

UNDER date of London, 5th January, 1912, the High Commissioner forwards an important communication in regard to the more favourable attitude of the Switzerland Government towards frozen meat.

According to a decree of the 12th November last, it appears that, subject to the proviso that all consignments must be transported as far as the frontier in suitably equipped refrigerator, or ordinary, cars, frozen meat from oversea countries will be admitted without the viscera adherent or being shown, beef being permitted to be in half or quarter carcasses, and sheep whole, but without the heads. Consignments intended for interior localities will not be examined at the frontier, but will be allowed to go right through to their destination, where the Customs formalities will be carried out, and where they will be examined by veterinarians appointed by the Cantons. The duty of the frontier veterinarians is restricted to the inspection of the cars transporting the meat.

Further, the duty on frozen meat entering Switzerland was to have been reduced from 25 francs to 10 francs from the 1st January of this year.

"The present change," writes the High Commissioner, "marks an important step in the direction of unrestricted importation of our meat into Continental countries."

A copy of the form of certificate which has been officially prescribed for the purposes of the Ordinance is appended on the opposite page. The certificate must bear an official seal or stamp.

THE POSITION IN AUSTRIA-HUNGARY.

The High Commissioner reports that the Agrarian party in the national Parliament of Austria-Hungary has recently rejected the proposals for the unrestricted importation of oversea meat and cattle from Russia and Servia. It is understood that a resolution was lately adopted to the effect that frozen meat is wholesome, and that its importation should not be prohibited by Hungary, and it will be seen that the present action renders this of no practical value. The desire

of the working-classes in Austria for cheaper food is therefore still unsatisfied, and no alteration in the Government's policy has been made.

[Translation.]

Form of Certificate.

CERTIFICATE OF ORIGIN AND DECLARATION OF INSPECTION OF MEATS
FOR CONSIGNMENTS OF MEAT AND MEAT-PREPARATIONS INTENDED
FOR IMPORTATION INTO SWITZERLAND.

A separate certificate is necessary for each kind of meat or meat-preparation.

Country of origin :..... Place of production :.....

Name of consignor : [*State the exact address of the consignor at the place of production*].

Description of consignment : [*According to its nature, weight, and packing, i.e.—*

(a.) For fresh meats : *Information as to the nature of the meat, and as to the number of animals (whole, in halves, or in quarters) or pieces, &c. (Art. 15 to 21 of the law).*

(b.) For meat-preparations : *Exact description of the contents, the number of cases, casks, &c., and indication of the marks and numbers of control, &c., affixed upon the case or package (Art. 22 of the law)].*

Place of destination :..... Canton :.....

Name of consignee : [*Insert the exact address*].

The undersigned veterinary inspector, officially charged with the inspection of meat at [*District, town, or public abattoir*], which is the place of production of the goods above described, certifies that this [*fresh meat or meat-preparation*] is wholesome and fit for consumption, and that it has been derived from [*cattle, sheep, goats, or pigs*] found, both before and after slaughter, to be healthy and free from contagious and infectious diseases.

This true declaration is made at....., the....., 19....

Veterinary Inspector, officially charged with the inspection of meat at [*District, town, &c.*].

[Official
seal.]

Signature :.....

WEST OF ENGLAND PORTS.

SOME indication of the development of the frozen produce business at West of England ports is furnished by information supplied by the High Commissioner. This goes to show that the Corporation of Bristol has authorized the expenditure of £20,000 for the purpose of providing additional cold-storage accommodation at the port of Avonmouth, while the Bute Dock authorities at Cardiff have arranged to proceed at once with the construction of additional cold-storage at a cost of £40,000.

GERMAN AGITATION.

THE VIEW OF THE HAMBURG CHAMBER OF COMMERCE.

From the Yearly Report of the Hamburg Chamber of Commerce for 1911, page 28.—Translation.

IN spite of these measures [measures for the provision of food, &c.] it is to be feared that the increase in the prices of provisions which has already taken place will be aggravated during late winter and the coming spring through further increase in the prices of meat. If at this time the prices of meat are not extremely high, and in part—pork, for instance—have even decreased, this can only be accounted for by the fact that in spite of the measures mentioned many farmers have seen themselves compelled to diminish their stock of cattle. It will therefore be necessary to take due precautions against the expected increase in the prices of meat. In conjunction with the efforts—mentioned in the last yearly report—in respect to the importation of frozen and chilled meat, the Chamber of Commerce is endeavouring to see that the required measures will be taken as soon as possible for maintaining in late winter a supply to meet the want in inland cattle products. We have already specially pointed out that the measures to be taken must not be transitory, as otherwise the importation of chilled and frozen meat, which, as regards expenses, is important to shipping, and trade cannot be practicably carried out; besides, a limitation of frozen meat must by no means be resolved upon, since chilled meat is the better, and, in any case in Germany, can be more easily transported; and, finally, not only the importation of mutton, but of beef, must be rendered possible, since the latter better meets the taste of the mass of the people. Of course, the importation can only be made practicable when the necessary alterations in the tariff and importation law are taken in hand. If the opponents of the importation of chilled and frozen meat point to the experiences of Austria, where corresponding measures have been accompanied by little success, such experiences cannot be looked upon as conclusive. According to a report of the Vienna Chamber of Commerce, the non-success in Austria is more especially to be attributed to the high tariff and faults in setting out (for sale) of the goods offered; that it was a passing measure, the employment of which did not yield revenue: these unfavourable concomitants have led

to the demand of prices which could only influence to its disadvantage the value of the meat. The experiences in Austria can prove entirely that the importation of cooled and frozen meat needs careful preparatory measures and good organization. On the other hand, it can only be assumed, according to the experience which England especially has had with the importation of cooled and frozen meat, that not only would a product of full value be offered to the lower middle classes, but that the home production could hardly be injured, since those classes who are to be considered in relation to cooled and frozen meat are such that, given even a sufficient stock of home-grown meat, they are only in small proportion in the position of being able to consume it. Already the Chamber of Commerce has pointed out that in England the prices of home-grown meat have not been injured by the importation of cooled and frozen meat. For those classes, on the other hand, which, in consequence of the high prices of vegetables, are now compelled to eat more sparingly of meat, cheap foreign meat would form an important contribution in sustaining life. It would be well to consider whether the importation of meat which is the spoil of the rifle could not be brought about, and whether the present difficulties attending the introduction over the frontier, under the unqualified certificates of health required, of cattle intended for immediate slaughter cannot be lessened. The setting-aside, during the course of the year, of the tuberculosis test, and the substitution in its place of the bacteriological and clinical examination, cannot be looked upon as a sufficient means of satisfying the pressing and necessary importation of cattle from abroad.

THE BRITISH MEAT MARKET. — QUESTION OF CONDEMNED MEAT.

THE Incorporated Society of Meat Importers has for some time past been in communication with the Corporation of the City of London on the question of the retention of sums realized from the disposal of meat condemned as unfit for food by the market Inspectors, &c. Hitherto the practice has been for any meat condemned to be seized by the Corporation, and the whole of the loss has therefore fallen on owners. The society has on this account been endeavouring to establish the right of its members to retain the property in any of their meat so condemned, after its value as food has been removed, and I have now received advice from the secretary of the conclusion of the negotiations on the matter.

He informs me that an agreement having effect as from the 1st August last has been entered into between the Corporation and the society, whereby the Corporation agrees to pay the importers (members of the Incorporated Society) the whole of the proceeds of the sale of unsound meat discovered by or handed over to the Corporation in ship, in store, or in transit between ship and store, providing that the entire control and supervision of destruction shall be in the hands of the Corporation, who shall be entitled to retain $7\frac{1}{2}$ per cent. of such proceeds towards the expenses incurred in connection with the treatment of the meat, and to charge 10s. 6d. for each certificate of the particulars of marks and weight issued by the Medical Officer of Health.—*High Commissioner for New Zealand, London, 30th November, 1911.*

NEW ZEALAND WOOL IN FRANCE.

THE whole of the wool and hemp exhibits displayed in the New Zealand Court at the Roubaix Exhibition, and which were very favourably commented upon at the time, have been presented by the Government, through the High Commissioner, to the Chamber of Commerce of Tourcoing, a neighbouring city of Roubaix, the two constituting the most important centres of development in the woollen industry of France. How the idea came about is thus described by the High Commissioner:—

“ I received a letter from the Chamber of Commerce of Tourcoing, in which they requested that a collection of specimens of wool and hemp be presented to them from the exhibits in the New Zealand Pavilion for permanent display in their commercial and industrial museum. Tourcoing and Roubaix are really one town, as Manchester and Salford are one, and are the chief centres of the wool trade in the Nord Department. The Chamber of Commerce recently opened rooms for the purpose of establishing a large museum in their handsome building in the centre of the town, and they were therefore desirous of securing good exhibits from all the countries trading with the North of France. They promised that if the specimens, and the case in which the wool was shown, were presented to them, they would use the whole as a central trophy in their museum, and place on it a clear indication that it was presented by the New Zealand Government.”

INTERNATIONAL TRADE.

AN interministerial Commission has been created with the object of inquiring into the demands of foreign countries touching questions of importations. Its aim is to discover what benefits France can ask for in exchange for what she concedes to other countries. Thus, for example, in the case of Denmark, which requests the right to import carcases of pigs, the Commission endeavours to find out what compensations could be exacted.—*L'Hygiène de la Viande et du Lait*.

I doubt if it is possible to find Holstein cattle on the Continent in a district free from foot-and-mouth disease, as English breeders are also anxious but unable to import fresh blood into this country.—*A Crabb, M.R.C.V.S., London, 1st December, 1911.*

A WEED-ERADICATOR.

IN the work of cleaning up a nursery the ordinary horse-hoe is not as effective as it might be. It certainly loosens the earth, but it does not cut all the weeds. To enable the hoe to do its work thoroughly a device has been adopted at Waerenga Experimental Farm which attains the desired effect. A knife, the width of the hoe, is attached at the back of the implement as shown in the illustration. This travels below the surface, and cuts off all the weeds which the hoes have missed.



According to a British parliamentary report, Denmark has a pig to every two inhabitants, and Ireland one to every three inhabitants.

THE HEMP INDUSTRY.

W. H. FERRIS.

WITH good bleaching weather in February the quality of the hemp reaching the grading-stores was of a decidedly improved character, colour—that important market consideration—being generally very satisfactory. Colour, of course, does not entirely depend on good bleaching conditions. Unless the fibre is carefully extracted by a proper management of the stripper it is impossible to ensure the desirable colour. Ineffective stripping—failure to remove all the vegetable matter—and bruising—owing to the stripper being improperly set or not maintained in a good dressing condition—are factors which quite preclude the securing of a sound colour in the finished fibre. Fortunately poor stripping is becoming less common, except in one or two districts where the most approved machinery has not been installed. Manawatu hemp especially is exhibiting an all-round improvement. The majority of the brands turned out last month were of high-pointed “good-fair,” and in several instances “fine” grade was reached.

AUCKLAND AND SOUTHLAND.

In both the Auckland and Southland districts the industry is not making much progress. Better values have not induced millers in either district to extend operations. The cost and difficulty of securing the raw material, generally growing in scattered and often inaccessible locations, means that prices would have to be much better than they are to warrant increased production. The quality of the fibre being milled in Auckland shows some improvement in the general standard of work.

GOOD SOUTHERN QUALITY.

In some Canterbury and Southland mills the quality of the fibre being turned out is of a high standard. This has been encouraged by the good prices given for the better qualities by local cordage-manufacturers. That these southern millers are able to produce fine hemp with the disadvantages they labour under—short and poor-quality leaf, difficult to secure, and generally working with out-of-date machinery—is distinctly creditable.

STRIPPER-SLIPS.

Little advantage is being taken of the market for this residual product. A good proportion of that being turned out continues to arrive in a very

unsatisfactory condition—wet and matted. Such lines have been condemned for export.

Tow.

There is a keen demand for tow, and millers are improving the market position of this by-product by shipping an excellent article. The great majority of lines are of good quality and quite free from dust and rubbish. Since the grading of tow was initiated, and the standard of quality thereby raised, the trade has extended its use in many directions, and the gratifying position has now been attained that it is a scarce commodity on the Home markets. If millers continue to turn out this article with the same care they are now taking with it there need be no fear as to future prospects.

THE HEMP MARKET.

IN the High Commissioner's market cable of the 13th January reference was made to the fact that the rise in value reported in the cable of the 7th January was due to a reported agreement made by the Mexican Government with regard to sisal hemp. The High Commissioner amplifies this statement in a special report dated London, 17th January. He says:—

“The arrangement is generally referred to as a ‘valorisation scheme,’ but so far no definite particulars have come to hand, and opinions are only based upon cabled information. The root of the matter lies in the very low prices which have been ruling for sisal recently. This hemp is used chiefly in the United States of America for binding-twine manufacture, and the greater part of the output is sold in New York. One of the largest buyers is the Harvester Trust—in fact, that organization would seem to be the ruling factor on the market. Owing to their large business, the trust, and indeed the other purchasers of sisal in both New York and London, have for some time pursued the policy of holding off the markets as much as possible, thus depressing prices and causing sellers to accumulate large stocks, which at last the merchants were forced to sell at practically any price offered.

“During last year in New York the price of sisal was down below 4 cents per pound—this being equal to about £17 10s. per ton—and London prices were correspondingly low. When it is remembered that at the beginning of 1910 £29 10s. was the ruling figure in London, and that the average for the whole of 1909 was something near £28 per ton, the extent of the drop will be apparent. Then, of course, the low prices helped to depress the values of Manila hemp and also that of New Zealand, and so the buyers could play one off against the other, as it were.

“ Things seem to have gone to such an extent that many growers found themselves at last unable to hold out any longer, and they approached the Mexican Government in the matter. The outcome is the so-called ‘valorisation scheme,’ and in the absence of definite details I can only give you an outline of the market opinion of this measure, which is known to have been agreed to by the Mexican Government by special Act of Parliament.

“ The idea seems to be that the Government, with the aid of the largest banks, will finance sellers with regard to their surplus hemp by making advances to them, and thus enabling them to wait for a favourable market. Apparently only sufficient hemp to meet the current demands will be marketed, and all growers are thought to be included in the scheme. A certain minimum selling price—5 cents per pound, New York (= £23 5s.)—£24 15s. to £25 here—is said to have been fixed, and, as a safeguard against overproduction, which these prices might otherwise induce, it is believed that some scheme of restriction of output will be imposed on growers; in fact, the whole scheme would seem to be on the lines of that of the Brazilian Government in regard to coffee.

“ The amount set aside by the Government for the purpose of financing the scheme is variously thought to be between half a million and one million pounds sterling, and the expenses of working will be met by a special export duty on sisal hemp.

“ Whether buyers found themselves short at the time of the publication of the scheme—about the middle of December—is not known, but at any rate the immediate effect was, as you are aware, for quotations to rise, and present rates show an advance of £3 per ton on those ruling about five weeks ago—to-day’s prices in New York being 5½ cents per pound, equal to £25 15s. to £26 London.

“ It remains to be seen whether the arrangement will work successfully, but Mexican planters are said to be hopeful of this result, and contend that sisal prices will remain higher for a considerable time.

“ From the point of view of New Zealand, this result is certainly to be hoped for, since values of manila are more or less affected by sisal prices, and of course the manila in turn affects New Zealand quotations. The rise to £22 5s. and £21 10s.—to-day’s prices for good-fair and fair respectively—from the £20 and £19 10s. ruling two months ago is a welcome spur, which doubtless New Zealand millers duly appreciate.”

The rape crop at Ruakura, on an undrained paddock, has been very successful, and proves the advantage of sowing in drill on the ridge, especially when sowing early, and on wet and foul land. The portion first eaten off is making a fine healthy second growth. This paddock, reports the manager, will easily fatten off from thirty to forty sheep per acre.

THE APIARY.

NOTES FOR APRIL.

F. A. JACOBSEN.

UNITING ONE COLONY WITH ANOTHER.

At all times of the season it is frequently necessary to unite one colony with another. Sometimes colonies become queenless when it is not practicable to give them another queen, and then the best course to pursue is to unite the queenless colony to one of normal strength. If colonies happen to be weak in the autumn it is advisable, even if they have a queen, to unite two or more of them to ensure safe wintering, always, of course, keeping the best queen. Many things may occur to necessitate uniting, and some fundamental facts in the behaviour of bees must be known to the beekeeper to make his operations a thorough success. If uniting should be done during a honey-flow there is less danger of loss of bees by fighting; and a fact which must be duly considered is that every colony has a distinctive odour of its own, and precautions must be taken to entirely obliterate or substantially diminish each distinguishing odour. A bee laden with honey and pollen from the fields and flying directly into other than its own hive is seldom molested, but a loafer trying to enter in the same way is promptly dealt with and either thrown out or killed. The colonies to be united may be shifted nearer each other at the rate of perhaps a foot or two each day until they are quite close together. If colonies from a distance apart were placed side by side at once, all the flying bees would go back to the old location and thereby be lost. Smoking must be done vigorously to kill the colony odour and to entirely disorganize the bees. For this purpose smoke from tobacco may sometimes be used, but it is not absolutely necessary. Care should be taken, if using tobacco-smoke, not to give too much, the bees being easily overcome by its use, which has a stupefying effect. The queen desired to be kept should be caged for a day or two.

Uniting two weak swarms to make one strong one is an easy matter, as, during swarming, memories of old locations are lost, and the bees, being full of honey, may be placed in any position the beekeeper wishes. It is a frequent occurrence for two or more swarms

to unite of their own account, thus proving that they are demoralized for the time being. Swarms may also be introduced to newly established colonies without much trouble. A method recommended by some beekeepers is the placing of a sheet of newspaper between the colonies to be united. Two or three small perforations should be made to give the upper bees a lead down. In this way the bees will unite gradually, and no fighting will take place. Numerous methods of uniting could be detailed, but it would be impossible to deal with them all here, so I have simply outlined some characteristics of bee behaviour to give a lead to those intending to unite.

TRANSFERRING.

Although it is against the law, and persons breaking this law are liable to prosecution, many box hives of bees are still in existence. They should be transferred as soon as possible, for box-hive colonies are of little value as honey-producers. The work need not be delayed until spring, but may be carried out at any time while brood is being raised, but, whenever possible, during a honey-flow: this to prevent robbing. If necessary, it may be done under a tent, such as is often used in manipulating colonies. To lessen the work, choose a time when the bees are busiest in the fields. The box hive is shifted to one side, and the new hive, with sheets of foundation or combs inside, is put in the old place with the entrance facing the same way. The box hive is now turned upside down and a small empty box fitted on top, and by drumming continuously on the sides of the full box the bees are made to desert the combs and take refuge in the empty one. When most of them have gone up the box they may be removed and dumped in front of the new hive. They will commence running in, when the queen should be looked for at the entrance. Failing to discover her, more bees should be drummed out of the box hive, as it is essential that the queen should be transferred or a new one introduced. If the box hive is discovered free from disease, the best combs of brood may be fitted into an empty frame or two and placed in the new hive. The remainder of the combs, &c., may be melted down for wax and the box burned.

If at the time this work is completed little honey is being gathered, the bees must be fed to avoid starvation. Equal parts of sugar and water mixed thoroughly together is the best substitute for honey, and is to be used in preference.

Sometimes bees find a home in the side of a house. To remove them a few boards may be taken out and the combs cut down. Care should be taken to get all the bees away, the best method being to put a little crude carbolic acid in the fuel of your smoker. This

is a most effective method of driving bees. Another way is to fix a bee-escape over the hole where the bees come out and patch up all other holes or crevices. The bees will now be able to come out, but cannot go back again, and the colony will soon die out of its own accord.

REGARDING ROBBING.

When there is very little or no honey-flow bees are liable to rob other colonies, and at this period care should be taken to put all combs, honey, &c., in safe keeping from the bees. Autumn is a particularly bad time for apiarists, and such small things as feeding or manipulating other colonies will often incite a whole apiary to rob various colonies. When this occurs all operations with the hives should cease; the entrance of the colonies being robbed should be contracted and grass or weeds thrown loosely over the entrance. Feeding should not be commenced until very late in the day, and then with every precaution to keep the colonies quiet. Should bees persist in robbing a certain hive, lock that hive up for a day and shift it; in its place put an empty hive with a bait of honey inside and allow the bees to enter through a bee-escape only. In this way robbers may be caught and destroyed.

FEEDING.

It is sometimes necessary to provide bees with artificial food—for instance, to induce brood-rearing in the early spring, supplying stores for them to winter on, and at other times when the beekeeper thinks it necessary. This food is supplied by the mixture of sugar and water. For stimulating brood-rearing about one-third sugar to two-thirds water should be used; but for wintering purposes as much sugar as warm water will dissolve—perhaps two parts of sugar to one of water—is preferable. Honey from an unknown source should never be used, as it may contain spores of foul-brood, and at all times cane-sugar is preferable. Cheaper grades or molasses should never be used for winter stores, as they would be liable to start “dysentery” and other diseases. Tartaric acid may be used sparingly for the purpose of converting the cane-sugar into invert sugar and so retard granulation. If honey of known purity is fed it should be diluted somewhat according to the season. The use of medicated syrups for the purpose of holding in check or curing foul-brood is not recommended. Such procedure has not proved itself of any material value. It is best to feed in the evening to guard against robbing. Different feeders are on the market for different purposes and for providing

winter stores. The division-board feeder is perhaps the best. This is as here illustrated. It hangs in the hive the same as and in place of a frame. From 15 lb. to 20 lb. of food can be given in this at one time. For spring feeding only a small quantity of thin syrup must be given daily to make the bees think a honey-flow is on and so commence brood-rearing. For this purpose almost any holding-receptacle that will go conveniently on top of the frames and under the cover will answer.



It is interesting to note that when a poor honey crop has been reported, for that season the fertilization of flowers and clovers has also been very poor. The nectar is supplied for no other purpose than to draw various insects to the clovers to act as fertilizing agents. Nectar is not secreted in the flowers unless the temperature is above a certain point.



THE PATENT BERRY HOE IN USE AT WAERENGA EXPERIMENTAL FARM FOR CLOSE CULTIVATION BETWEEN ROWS OF VINES OR SIMILAR PLANTS.

ORCHARD WORK FOR APRIL.

W. A. BOUCHER.

MUCH of the important work for the season will now have been completed in many localities, though crops of late apples and pears will still require to be gathered and packed.

CULTIVATION.

In districts and soils where autumn and winter growth is rapid, and where humus in the soil is desired, further cultivation for the season may be dispensed with so as to allow a natural growth to be produced sufficient in quantity to be of value when turned under at the first spring ploughing.

In the setting-out of young orchards many growers prefer autumn to spring planting. In such instances the preliminary preparation of the land should be well in hand, for in many districts, especially in the case of clay soils, if preparation of the land and planting be too long delayed rains more or less persistent may set in, and by keeping the soil saturated and cold make it advisable to defer planting until the spring.

STRAWBERRY-PLANTING.

In some parts of the Dominion the month of April is the most suitable for the planting of the strawberry; while in others it is not advisable to plant till the month of May. The reason why early planting is desirable is that if the young plants are set out when the soil is warm and moist they will at once send out fresh fibrous roots and become well established before cold weather and a cold soil check further growth for the season. They are then in a position to respond rapidly to spring weather, and become productive during the summer. If planted too late but little if any growth of fibrous roots will be made before spring, with the result that during the spring and early summer months the plants will devote their energies to becoming established, and thus the crop for the season will be of little or no value.

While considering the planting of the strawberry, it may be as well to advise growers that good drainage, deep working, and thorough preparation of the soil are essential, for, generally speaking, the heavier lands are selected for the planting of this fruit. Many of the lighter lands should grow the strawberry to perfection, but experience has proved that these lands are already or become so rapidly infected with the larvæ of the grass-grub, cut-worms, and other root pests—which so far have proved practically uncontrollable—that unsatisfactory results are almost inevitable.

ORCHARD PESTS AND DISEASES.

But little trouble for the rest of the season will be experienced with most orchard pests and parasitic fungi. To those, however, who are anxious to make an early start with the winter work a word of warning with regard to the use of red oils may be of service. In former issues of this *Journal* growers have been advised to spray with the red oils only when the trees are quite dormant. This advice has special application with regard to the peach, otherwise serious injury may be done. Do not use the red-oil spray on peach-trees until the wood has thoroughly ripened and the leaves have dropped, indicating the dormant condition which denotes safety.



APPLE-TREES IN BLOSSOM IN A NELSON ORCHARD.

CONTROL OF WOOLLY APHIS.

THIS Sturmer Pippin tree, illustrated on the opposite page, was treated for woolly aphis, at Weraroa Experimental Farm, in August, 1910, according to the plan detailed by Mr. W. H. Taylor, in the *Journal* for July, 1911. The tree was very badly affected. The only infection since treatment has been on the scars of cuts made since treatment. New cuts, as they expose the sap, should be treated with the oil. It has been found that where this was done there has been no infection in seventeen months. The cost of treating this tree was about fourpence. The tree has not been sprayed except with arsenate of lead.



CONTROL OF WOOLLY APHIS AT WERAROA EXPERIMENTAL FARM.

THE FARM GARDEN.

W. H. TAYLOR.

THE main supply of turnips for winter use should be provided for by sowing seed by the end of March. The area sown should be greater than heretofore, as it will be the last seed put in till August. Superphosphate and bonemeal mixed, or basic slag, are suitable manures. To mention a given weight per acre is sure to be misleading, and it is difficult to work out when small plots are sown by hand. Probably it is never attempted. I do not consider it necessary in any case. If the manure is broadcasted before drawing the drills, spreading it as though it were grass-seed, and about the same thickness, will be sufficient, and not be in excess. The seed should not be sown thickly, and ultimate thinning should be done as soon as possible. Garden turnips should not be thinned to a single line of plants, as in the field. The object is not to produce large bulbs, but quite the opposite. Growers for market have the plants several deep in the drill, so that the produce from a given space is as great as can be, while the size of the individuals is thereby kept to moderate proportions. Golden Ball and Orange Jelly, both yellow-fleshed varieties, usually stand longer than the white sorts, and are of excellent quality in winter-time. Some white sort, as Snowball or White Stone, may also be sown, as some people prefer them.

Cauliflower, cabbage, and lettuce seed should be put in at the end of March. This will provide plants for spring and summer use, to be put out at the end of winter and early spring. Early supplies appear to be the greatest puzzle to the uninitiated. Very few novices realize the fact that the plants take so long to prepare, consequently planting-time usually finds them minus the plants.

CAULIFLOWERS.

The beds for sowing cauliflower-seed at this time should be raised a little above the surrounding surface, unless the soil is light and well drained. As soon as the plants are large enough to handle they should be lifted carefully, and be replanted about 2 in. asunder in beds of good soil. This is a precaution very necessary with cauliflower-plants, which have a tendency to button prematurely unless they are given the best of cultural treatment.

Cauliflowers were formerly very sharply divided into two sections—viz., the early small-headed sorts and the late giant kinds. There are now many intermediate varieties, though the old ones still remain with

us. Early London is one of the oldest early sorts, and of this type there are a number, differing chiefly in name. There is some danger in relying on these types, for, unless the soil and cultivation is of the best, they are very liable to premature buttoning. They are the earliest, however, and should be grown if good treatment in every way can be assured. The intermediate varieties are well represented by Early Erfurt, a variety hardier than Early London, less liable to button prematurely, but just a little later. The giant kinds take longer to head. Veitch's Autumn Giant is a true representative of the class. Not less than two varieties should be sown if a long-continued supply is desired. If only two are to be sown, then omit Early London. It may be expected that the early sort will be in use from mid-November till well in to January, and the latter will begin to come in soon after Christmas, perhaps a little before.

CABBAGES.

Having grown many varieties over a large number of years, I am not able to say that any are particularly adapted for spring crops. I find that all the garden cabbages answer the purpose equally well, even granting that a certain sort might get a hard heart a week or so before others—and I admit this to be the case. It is, after all, no advantage, except to a grower for market, for the quicker sort is smaller. Any other kinds will be fit for use, though not quite so hard at the same time, and the difference is nothing considering the life of the bed.

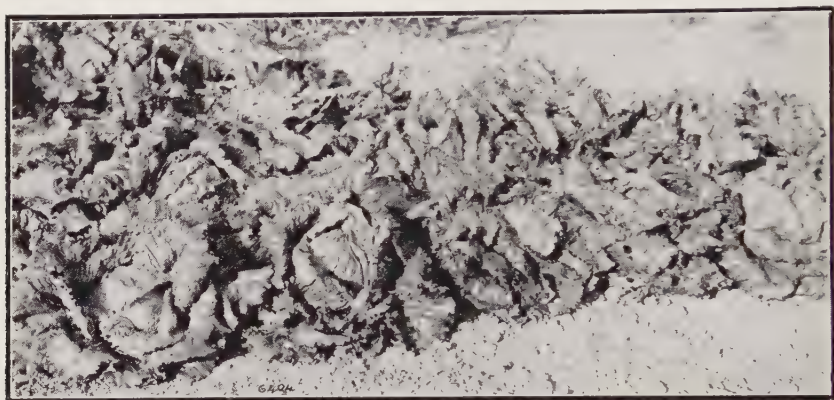
WINTER RHUBARB.

Winter rhubarb is a useful thing to grow. Though termed "winter," it is really adapted for use all the year round. It is readily raised from seed, and comes quickly into use. A pulling has already been made here from plants raised from seed sown on the 10th of November last. If any one has a bed of seedlings that are too crowded they may be at once thinned to the proper distance—not less than 30 in. each way—and the lifted plants transplanted to fresh quarters. The soil should be good, and should be manured with stable or farmyard manure.

LETTUCES.

Seed sown at the time mentioned provides for the supply of lettuces from early in November until those sown in spring come in. It should be recognized that the early lettuces are the very best of the season, and are usually the most eagerly sought for. The incoming warm weather creates a desire for such things. If this were more distinctly understood more care would be taken to secure the crop. Some people have a fancy for the Cos varieties. In this part of the world they never come to perfection, being merely a bunch of unblanched leaves. In the Old Country the Cos varieties are those most commonly grown, the cabbage varieties

being used for forcing and the earliest crop; but a Cos lettuce there is quite different from one here. I have never yet seen a well-hearted Cos lettuce in New Zealand. They usually heat and partially decay when tied for blanching, and they will not blanch without tying. The cabbage varieties are the best to grow here. There are two distinct types. One has a smooth appearance, round leaves, and light-yellow colour. Cali-



LETTUCES AT WERAROA EXPERIMENTAL FARM.

Webb's Wonderful.—Sown 2nd September, and manured with stable manure.

fornian Cream Butter, Way-ahead, and others, are of that type. These are excellent summer sorts, but not the best for standing the winter, being soft. The hardier type is of the Tennis-ball and All-the-year-round blood. Webb's Wonderful is a larger development of them, and I find it good, the hearts being large and solid. There are many other varieties of the same type.

WORK IN GENERAL.

There is at this time very little work among vegetables other than maintenance work. Weeds should be kept down. Crops such as cabbages, &c., should be well moulded up. Onions that have finished growing should be pulled up and laid on their sides for a few days to dry. A little care should be taken to see that they are on their sides, for if they stand on the root end and it happens to rain, thus delaying carrying off, they will speedily make new roots, and thus be ruined.

The steamer "Kaipara," which sailed from Wellington for London on the 8th instant, took the first apple shipment of the 1911-12 season. It totalled 5,504 cases, Jonathans, Munroe's Favourite, Five-crown Pippin, Sturmer Pippin, and Alfrestons comprising the bulk of consignment. Of this total, 5,401 cases are being shipped under the Government guarantee of a return of 1d. a pound net to the grower. The shipment was well graded and packed, and should arrive in good condition.

THE POULTRY INDUSTRY.

F. C. BROWN.

HOUSING.

LAST month the question of housing was touched on. It was laid down that while the deep, open-fronted house was the ideal, the structure must be absolutely draught-proof. Since that note was written I have seen a house which had much to recommend it, and which met the above requirements in all but one vital essential, and this constituted a serious weakness: it was not draught-proof. Thinking that the open front did not give sufficient air, the owner of the plant had left an open space between the top of the back wall and the roof. The danger from the draught thus created was intensified by the birds being made to perch at a considerable height from the floor, so that they were practically subject to the full force of the draught all the time they were on the perches, just when they required the most comfortable conditions. It was not surprising under the circumstances to find that the birds were badly affected by colds, bordering in some cases on roup.

The point which should never be lost sight of is that in constructing a house for feathered stock the maximum amount of comfort should be combined with the maximum supply of fresh air, while every precaution should be taken to prevent draughts. The slightest crevice or crack should be obviated.

Where the house is a very long one it is always advisable to place some light partition (but air-proof) between the sections. If wire netting only is used between the compartments a strong wind, having nothing to check its force, is apt to cause discomfort to the birds. A cheap roofing-material is suitable for this purpose, but should at least be strengthened by wire netting. For the purpose for which they are sold, however, the majority of roofing-felts are dear in the long-run. Depreciation, quite apart from the well-being of the flock, should be always taken into account.

Several readers state that they have gone in for the continuous housing system, and have adopted the idea of making the roosting and scratching compartments separate. I do not favour this. The much better plan, to my mind, is to have the two in one, the roosting arrangements being provided at the back of the building.

This method enables the birds to roost in comfort the while they can inhale fresh air, the most important consideration in checking disease. Where the roosting-place is by itself the roosts have to be brought nearer the front of the house, and then the front has to be partly or entirely closed up to protect the birds from the weather. Again, with birds in a narrow compartment, and thus requiring a deep row of perches, the dropping-board has naturally to be deep also. This makes the work of cleaning it difficult, and it is thus never in as satisfactory a sanitary condition as it should be.

As to the dropping-board question: Considering that too many of these are not kept in as sanitary a state as they should be, and that accumulated manure is not a good thing for a bird to be roosting over of a night, to say nothing of the harbour for vermin and disease-germs too many dropping-boards present, I am strongly in favour of doing away with dropping-boards altogether on the ordinary plant and in the farmer's fowlhouse. In this case the necessary precaution should be taken to prevent the litter becoming mixed with the droppings from the perches. This can be managed with extreme simplicity. All that is required is a 12 in. board set on edge on the ground about 6 in. in front of the outside perch—or any system of boarding to the same height will do. In cleaning, the perches can be lifted, and the manure thus removed with ease.

Nests, another source of contamination and disease—in fact the principal harbour for vermin on the plant—should be kept as distinct from the interior of the house as possible, and be always maintained in a clean condition. The best plan is to construct them so that they will project from the front of the house, but preferably not touching it. If the nest-boxes are made a shade larger than a kerosene-tin, the bottom half of the latter cut away a little in the front can rest inside and form a sanitary nest—that is, it can be easily removed and be effectively cleaned. The nests should be so constructed that the eggs can be collected from the outside in good weather, and from the inside of the house in bad weather; so that, no matter when the eggs may be gathered, they will be in a clean state.

I cannot advise too strongly the use of tar to cover up crevices and joinings, the common harbouring-places of vermin, especially of that vicious little night marauder, the red mite. Tar, thoroughly applied, means every crevice and crack covered up—in fact, a house free of draught, devoid of a resting-place for vermin, and one which can be easily and effectively cleaned. Vermin are most active in hot weather, and at such a time the tar is soft and is then most objectionable to insect-life. A good feature of tar is that it is a timber-preservative.

An advantage tar presents over whitewash is that, while it is not so attractive a covering for timber, it can be thoroughly effective, whereas whitewash is too often only an ineffective and deceptive covering. I have seen fowlhouse interiors which looked beautifully clean to the eye, but with swarms of insects breeding behind the caked whitewash, while the red mites were thick in out-of-the-way corners which the whitewash-brush could not reach.

The advantages of a deep continuous house are many. In the first place, the number of birds which can be kept on a plant can be enormously increased, the work of attending to the stock can be greatly reduced, and the securing of winter eggs can be made much more certain. People who keep fowls in confined areas, especially in towns, would find such a house an ideal arrangement, as it quite obviates the necessity of having a run. With the birds always under cover the manure does not come in contact with moisture, and, drying up in the litter does not cause any offensive smell, thereby taking away any unpleasantness from the keeping of poultry; in fact, there need be no difference from keeping fowls in a back-yard than from keeping singing-birds in an aviary. Everything being under cover makes for healthy condition of stock and comfort for those attending them.

A simple way of watering birds in a continuous house is to provide a little gutter along the front of the house on top of the nests, the fixed top board over the nests providing a standing-place.

Of course, even with the deep continuous winter-egg house, runs, while not imperative, are desirable, though these need not be of an extensive nature. The fowls can thus secure additional exercise in dry weather, while the runs, not being always in use, can be made to carry grass as well as other green stuff which will provide the birds with a desirable tonic.

COLDS IN YOUNG STOCK.

Many cases are reported of colds in young stock, in some cases developing into roup. Almost invariably the trouble is with late-hatched chicks, while disposing causes have been overcrowding of the young birds and keeping them in draughty houses. It should hardly require emphasizing that in handling artificially reared chickens, which have been brought up under practically hothouse conditions, special care must be taken with them after they are taken from the brooder. This does not mean that they should be coddled or crowded in small ill-ventilated quarters. They should rather be intelligently handled throughout, especially being protected from extremes of weather. A necessary provision is that the house should be roomy, well lighted, and draught-proof—with an open front if possible—so that they can be fed in this in wet weather, and fed early in the evening so that they

will not be moping about with wet plumage waiting for their evening meal thrown down in a muddy yard. In dealing with colds and roup, the best advice is to prevent it, and if birds become affected the cause should be sought and at once removed. The best and most simple method of treatment is to place a little Condy's crystals in the drinking-water. Put half a teaspoonful in a pint bottle of water. Add a dessertspoonful of this mixture to two quarts of drinking-water three times a week, and on these days allow no access to other water. If this should fail, inject with a small syringe into the nostrils and mouth equal parts of peroxide of hydrogen and water.

MARKETING EGGS.

In the marketing of any product it is recognized in these days of keen competition that uniformity and attractiveness are practically equal to the great consideration of quality. In all lines of farm-produce this is being forced home to farmers in a manner they can no longer afford to ignore. They have been greatly assisted in this by State agricultural services, which have instituted the grading of certain products by experts. New Zealand dairy-produce has now earned for itself an enviable reputation on oversea markets by reason of official classification. Fruit-growers are awakening to the urgent need of packing their produce in a uniform and attractive manner. Poultry-men have yet to learn the lesson. The other day I saw preserved eggs on the counter of one of the leading grocery firms of Wellington which were as uninviting as they could well be. The eggs were all colours and sizes. Some were blue duck-eggs weighing up to 3 oz., and others were little brown eggs which would not turn the scale at more than $1\frac{1}{4}$ oz., the bulk of the eggs ranging between these extremes. The preservative was thick upon the eggs. The ticketed price was 1s. 3d.—a big return, for, if appearance goes for anything, the eggs were not good value. It is such eggs coming on the market first which sets a low value for preserved eggs in general. Preserved eggs are announced, and if the first supply is of such a wretched description as the case I saw it is obvious that the consumer will not rush them. So the price has to be reduced, perhaps a second or a third time, till the price is so tempting to the consumer that a sale is made possible. A price has thus been established for preserved eggs as a whole. The supplier of a good article—systematically put fresh into pickle, of even size, and with colours distinct—suffers seriously in consequence. His reliable eggs have to be sold at the value of the unsatisfactory lines.

The same trouble exists with fresh eggs. The marketing of these in jumble lots has the effect of reducing the value of eggs in general. Again, the packing of different-coloured eggs together is a market

weakness. The man who is anxious to build up a high-class trade must have regard to this feature. It will be a simple matter for him if he keeps only one standard breed. Then all his eggs will be uniform, and uniform in shape and size as well as in colour. In the marketing of eggs all the blame of the very unsatisfactory methods in vogue is not attachable to the producer. The middleman is not always as careful as he should be. Instead of keeping uniform lines intact, there is a tendency to mix them together in order to make a big show in a window. As to window displays: What a remarkable difference there is in the means adopted to exhibit fruit and eggs! The up-to-date fruiterer makes, by dint of polishing and fine grading, a beautiful effect, but the more valuable and more delicate egg has none of this care taken with it to attract the eye of the buyer. Fruit is made to look better than it really is, while eggs seldom or never give the consumer any idea of their true quality or condition, being mostly exhibited in a dirty, ill-sorted collection, which few people would be induced to buy on their appearance.

VERMIN.

The value of the dust-bath in assisting fowls to free themselves of vermin is not appreciated as it should be. I have lately seen a flock badly infested with vermin, but not a soft inch of ground for them to make a dust-bath. It would only have taken the owner half an hour to have spaded up a corner in each of the sun-baked runs, and have made the dusting-holes the birds were craving for; and as there were shrubs in every run, an ideal place was present for dusting-baths.

A dusting-corner is sometimes provided inside the house—and this is necessary in the covered-run house—but this is not always appreciated unless it is continually freshened up by the addition of new material. Where the ordinary house is used the best place for a dusting-bath is on the sunny side of a shrub in the run. Any dust-bath should be frequently spaded up.

It is not generally realized that feather-pulling is frequently caused by birds being badly infected with vermin. Should a bird acquire the habit in a run where vermin is bad, it will soon find every other bird willing to allow its feathers to be pulled out; this owing to the severe irritation caused by the lice. In watching a pen of feather-pullers it is surprising to see how the hens will invite the culprit to pluck them, and that all the damage is probably being done by one or two birds. Careful observation will locate these, and if they are decapitated and proper dusting-places at once provided for the flock the trouble may be stopped. Instances have certainly occurred where feather-pulling has taken place in flocks free of vermin; but here the

birds have been very closely confined, and have not been provided with litter in order to keep them occupied and in a healthy condition.

While prevention is the best of all means of dealing with this and similar troubles in poultry, it may happen that a feather-puller is a valuable bird which it is desired to keep for breeding purposes. If this be the case, the trouble may be stopped by nipping off the tip of the upper part of the beak. It is cruel, however, to do this if the cause is not removed.

BREEDING TO A SANE STANDARD.

In criticizing the improved types of the general-purpose breeds—take the Black Orpington for example—the critic is prone to find fault with it because of what he considers to be a deterioration in regard to size. This is more apparent than real. The tighter feathering, making for constitution, of the laying strain of Black Orpington covers almost as



INCUBATOR-ROOM AT THE DEPARTMENT'S MILTON POULTRY PLANT.

good a frame as the original loosely feathered, phlegmatic bird, while the texture of the flesh has vastly improved. Thus, instead of the table quality of the breed having suffered by reason of development of the egg-producing power refining the frame, it has had rather the opposite effect, for while the weight may be slightly reduced the quality of the flesh practically makes up for it. Naturally, the high-type layer is finer in its texture than the poor layer, and fineness in texture means not only better quality of flesh but finer quality of bone, an important consideration in any animal used for food purposes, as the smaller the bone the higher the proportion of flesh and the smaller the proportion of waste.

In aiming at developing the egg-producing power there is a not unnatural tendency—a common mistake in the live-stock world—to overlook desirable characters in aiming at a special feature. Thus many poultrymen think they have secured, by the outlay of a few sovereigns, the secret of selecting a layer, and they choose their breeders according to this alleged index irrespective of the points indicative of the vital consideration of constitution and of the necessary breed qualities. This tendency may easily lead a man into producing birds of all shapes and colours, and then, having failed to maintain constitution, have a flock without the power to resist the first disease that attacks them.

While we have every reason to congratulate ourselves on the advancement made of recent years, especially in Australasia, in the egg-yielding quality of certain breeds of poultry, it is well to remember that the power to produce eggs is not everything. Just as breeders of the old school made mistakes in exaggerating useless characters, so the men now aiming at a high egg-yield are displaying a weakness in making this their only consideration. The breeders of the Old Country who were responsible for the British breeds of poultry performed a monumental task in bringing these to their high state of perfection, even granting that they too often lost sight of utility characters; and it should be our aim that, while bringing the breeds back to a more sane type, we do not go to the other extreme. The fancier of old, it must be agreed, was an enthusiast, and, according to his lights, worked hard in his singleness of purpose. He was a lover of bird-life, and fed and cared for his stock in a praiseworthy manner. The new school, which has utility for its standard, may well take a lesson from their fancy predecessors in this connection, especially as their utility stock gives them a much more handsome return than the old fancy birds gave to the enthusiast who bred them, some of whom, indeed, still adhere to birds whose fine plumage is their strongest point.

POULTRY SHOWS NECESSARY.

Poultry shows, in the ordinary acceptance of the term, are certainly on the down grade, but may the day never go for the show where our many beautiful types of domestic poultry may be seen to perfection, but of a type in which breed characters are happily blended with utility characters. I would go further than this, and appeal to all lovers of feathered stock to accept the new order and vigorously pursue the show campaign. Unless we have the show-pen competition, the breeds will rapidly decline in quality, and we will be breeding nothing but mongrels. To this end, amendment of the standard for judging poultry is required. A good means to bring this about would be for the poultry-show societies to arrange with representative utility breeders to confer and bring about a common ground of agreement as to the recently published utility standard, and endeavour, if possible, to produce common-sense standards.

Beauty and utility are not inseparable, but in the absence of public competition this fact is apt to be ignored, if not lost light of altogether. Our aim should be to combine the two rather than absorb one with the other. The best example, perhaps, we have to guide us is in the sheep world. In judging sheep the main considerations are utility characters. Constitution is regarded of paramount importance, but mutton breeds must have the symmetry of frame and the proper development of flesh on the most valuable parts, while sheep whose wool is the main consideration require to have length, density, and quality of wool; but still, in either case, no animal can get into the prize-list that does not conform to the special type of the breed, even an unlucky black spot spelling at times disqualification. Thus we have a striking example of a happy combination of utility and breed characters dominated by the vital requirements of constitution.

It must be admitted that in judging poultry there is a special difficulty in connection with parti-coloured breeds. At present the best-marked birds must win, and in considering, under the new order, utility character and constitution, such a bird would very probably have to be disrated. It may be worthy of consideration whether or not such breeds should not be excluded from the improved standardization, and be left to be catered for in special classes as purely fancy races of poultry. The self-coloured bird can be reformed with ease, but it will be an almost insuperable problem attempting to improve the utility characters of birds with fancy plumage while still retaining their peculiarities of feather-colouring.

THINGS TO REMEMBER.

A crack in the fowlhouse is an invitation to disease.

Lameness in the right leg is often a sign of tuberculosis.

The pet hen is generally the best layer in the flock.

Market-poultry is generally a frame. Why not put some flesh on it? It will pay.

Do not rush into poultry-keeping on figures based on theoretical deductions.

Don't accept all fresh theories that come to light. Practical experience is required to test their value.

It takes but a comparatively short time to build up a reputation for first-quality eggs and poultry. It takes no time to lose it.

A dozen eggs at ninepence with three bad ones among them means a shilling a dozen.

Guaranteed fresh eggs are worth 1d. to 2d. per dozen more than the ordinary kind. Go for the extra money.

It is the vigorous productive hen that is the first off the roost and the last on it.

WEATHER AND CROPS.

FEBRUARY.

OFFICERS of the Department report as follows on the weather of the past month and on the condition of pastures and crops :—

WHANGAREI.—The weather for this month has been dry. There have been occasional showers, but the rainfall has been insufficient to make any noticeable difference in the growth of grass, especially in the Whangarei district. Lower down in the Rodney and Otamatea district there has been more rain, and the growth of grass is much better. Harvesting of Waipa browntop is just commencing, and there is every indication of a good yield of seed. Milk-returns are rather below the average for this month of the season.—*A. P. Speedy.*

AUCKLAND.—From a farmer's point of view the weather during the month was all that could be desired. At the commencement it opened fine, and looked as if a drought was about to set in. The paddocks got dried up, and grass took on a withered appearance. Even stock in places were beginning to feel the pinch for the want of good wholesome water to drink. Unexpectedly, as the month progressed, rain set in fairly heavy, and this saved the situation. Grass paddocks freshened up, and roots and maize crops were much improved. The harvesting is pretty well finished, and the crops have been stacked in fairly good condition. Small areas of barley (sown late) still have to be harvested; but these are of little consequence, as the bulk of the crop has been harvested in good condition. Farmers are busy now ploughing in their stubble land, while others are paying attention to the clearing of their noxious weeds and making their places look tidy.—*R. Rowan.*

TE AROHA.—The weather has been good, with occasional showers of rain, which has been beneficial to root crops and pastures. Oat harvesting is practically over, and the crops are heavy and of good quality. Turnips, rape, and mangels are looking well. Turnips are turning out better than was anticipated, several plots averaging 6 tons per acre.—*J. L. Morris.*

WAIKATO.—With the exception of the rains on the 28th and 29th, February has been a very dry month. Feed is somewhat scarce, and the milk-yield has diminished considerably throughout the district. Hay and grain crops have been harvested in good order.—*J. Kerr.*

CAMBRIDGE.—The weather during the month of February was on the whole dry; but nice showers at intervals greatly assisted the crops and pastures, though the milk-yield is considerably below last month owing to pastures drying up. Good rains have fallen throughout the district within the last few days.—*A. A. Clapcott.*

KING-COUNTRY.—The weather in February was warm and humid, the bright sunshine and alternative showers being favourable to pastures and root crops. Oat crops have ripened rapidly, the bulk being harvested between the showers with every prospect of good yields. Just enough rain has fallen to prevent settlers with fallen bush from burning—the main drawback in the weather conditions for the month.—*B. Bayly.*

OHAKUNE.—The weather conditions for the past month have been very unfavourable, particularly to the farming community, to whom fine weather is essential. The rainfall recorded for the month was 4.45 in. Although the area harvested is equal to that of last year, the season being so unfavourable the returns will in all probability not reach the same standard of quality and quantity. Oats, with the exception of a few areas, are still very much on the green side, and need a week or ten days' favourable weather. Potato-areas have been affected by the recurring frosts. The amount of bushfelling and burning this season will materially enlarge the area of cleared ground in the different blocks throughout the district. There is still an abundance of feed in the pastures.—*P. Barry.*

WANGANUI.—Frequent showers, in cases exceptionally heavy, militated severely against effective harvesting of hay and grain crops during the second and third week of February. Fairly fine weather was experienced for remainder of month. The temperature of the first three weeks was mild generally, with occasional cold periods, and wind was persistent, sometimes blowing with hurricane force. Close hot weather obtained during last week of the month. Root and grain crops generally are looking well, with the exception of maize, which remains stunted, due to continued unsuitable weather.—*C. Watson.*

STRATFORD.—A fine growing month, with a few wet days and very heavy dews, which has had the effect of bringing on the root crops and green feed. Most of the hay has been well saved, and heavy yields are the rule.—*Austin F. Wilson.*

HAWERA.—Nice warm summer weather has been experienced during the month, with good rains at convenient intervals. Turnip and root crops generally are looking well and making good growth. The bulk of the grain crop has been harvested in good condition, and yields are expected to be above the average.—*A. J. Glasson.*

OROUA.—From the 1st to the 24th the weather was cold and boisterous, humid conditions prevailing from the 24th to the 29th. Recent rains should enable farmers to prepare their lands for sowing down, and also enable them to turn their stubbles up to be sweetened by the sun before sowing their autumn crops. If the teams were put into the paddock almost before the crop is carted off it would save the manure bill. If there should be a goodly amount of undergrowth the ploughing under of this will add humus to the soil.—*William Dibble.*

KIWITEA AND RANGITIKEI.—Ideal weather prevailed during the month, there being sufficient rains and sunshine to keep this grass country right. An abundance of feed everywhere. The prospects are very bright for a good supply of grass for the winter months. Cocksfoot cutting and threshing is being retarded owing to the rainy season. Blight is fairly prevalent in potatoes, but good yields are being obtained.—*J. A. Melrose.*

MANAWATU.—The weather throughout the month of February has been changeable. Rain fell on six days; total, 2.19 in. Most of this fell on two days—0.77 in. on the 9th, and 1 in. on the 14th. The wind has been westerly on the whole, and has retarded grass-seed work. Pastures have been good. Grain crops are good, and grass-seed crops are big, but the quality is light. Early-sown root crops were unsatisfactory, but later ones are better.—*W. Dalgliesh.*

POVERTY BAY.—Good rain has fallen during the month of February throughout the driest portions of this district, and pastures are already showing a green tint. If the present warm weather continues for a time there should be good feed for winter use.—*Wm. Ross.*

WAIPIKURAU.—The weather has been very dry north of Takapau, light showers falling, which were not of much benefit to pastures. From the 25th to date the weather has been broken, and should the wind keep away there will yet be a fair growth of grass. South of Takapau the country is looking well, the weather being broken right through the month. There is an abundance of feed where it is not too heavily stocked.—*H. O. M. Christie.*

PAHIATUA.—Nineteen days fine weather. Rain fell on ten days, the heaviest fall being on the 9th instant (2.97 in.). The total rainfall was 5.02 in., against 3.45 in. for the corresponding month of last year. The weather is having a good influence on pastures and crops. On the whole green maize has been a failure, but turnips are coming along nicely.—*T. Bacon.*

NORTHERN WAIRARAPA.—In the bush district north-west of Masterton and Eketahuna there is abundance of feed on account of the showery weather. Stock is looking well, and settlers have told me the cows are milking well for this time of the year. The common trouble in the bush district is the scarcity of winter feed. Crops have been safely gathered in, except in a few cases, and these will be all in by the middle of the month.—*J. S. Rankin.*

WAIRARAPA COASTAL DISTRICTS.—The weather has been mild—some very warm days with showers and occasionally a fair amount of wind. Pastures are all looking well. A frost during the month cut down several maize crops, but other crops have done exceptionally well. In several instances the oat yield was 100 bushels to the acre, and in other cases 90 and 84 bushels—much better than previous crops. Wheat has also done well. Several growers have obtained 60 and 70 bushels to the acre. A large area of swedes are now being sown on the stubble land.—*T. C. Webb.*

CARTERTON.—The weather has been very broken. Heavy rains have been general, except during one fine week in the middle of the month. Several light frosts were experienced. Rabbit-poisoning has been seriously delayed through the rough weather. Feed is plentiful on the open country. Green maize has been checked by frost and wind. Rape and root crops are of a fair description. Oats are generally good.—*S. C. Ivens.*

WELLINGTON.—Early in the month the weather was squally and rough. Later on the climatic conditions improved. The good rains which fell freshened up pastures, and largely benefited all crops.—*G. H. Jenkinson.*

MARLBOROUGH.—The weather on the whole was fine during the month, heavy rain falling on only four days—the 9th, 10th, 14th, and 15th—when all the rivers were in flood. There have been only about five hot days, the remainder being on the cold side for summer. There was very heavy dew on three nights, and towards morning very cold temperatures. Strong winds that have been prevalent did a good deal of harm to orchards.—*F. H. Brittain.*

NELSON.—Showers of rain have fallen during the month. This has kept the pastures green. Root crops are growing well, but the weather has delayed the harvesting of some of the late crops. It is the best season for feed for many years, and stock should be in good demand. The grain crops are good, and most of them are in stack, though there are odd fields still in stook. The potatoes on the whole look well, though the blight has begun to attack them in some places.—*G. J. Ward.*

HOKITIKA.—Most unseasonable weather, more like midwinter than summer. The rainfall registered to date (26th) is 7.24 in. There have also been several heavy showers of hail with snow on the high country. The farmer has fared badly, as in a good many instances the crops of hay and oats are absolutely ruined, the bad weather catching the crops just after reaping. This shows the necessity, especially on the West Coast, where the farmer almost solely depends on his crop of hay for winter feed, of going in for ensilage. Fruit crops are poor, and nothing seems to have ripened. Everything points to an early winter.—*H. J. Walton.*

AMURI-CHEVIOT.—The weather for the first part of the month was very warm, and was accompanied by strong north-west winds. On the 5th instant the temperature was very high, the thermometer registering 94° in the shade. Very heavy rain followed on the 8th instant, 2 in. being recorded. This retarded harvesting for a time, but did a great amount of good to green crops and pastures. Harvesting is now almost completed, and threshing is being carried out. Good yields are being obtained all over the district. The season, so far, from an agricultural and pastoral point of view, has been excellent.—*W. M. Munro.*

ASHLEY.—The weather has been showery this month, but the farmers have taken advantage of every fine day and have got a lot of grain into stack. A few have threshed small lots from stook. Grass is very abundant, but "slushy." From what I have seen potatoes are not so large as in previous years, and although I have seen several rotten ones I have not come across a true case of Irish blight. The rot seems to have been caused by the wet. The grass-grub has not been nearly as bad as last year. Although aphid is on the turnips, rape, &c., it is not nearly as bad as last year.—*A. Hughes.*

LINCOLN.—During February rain frequently interrupted the work of harvest; still, fairly satisfactory progress has been made. The weather being cold during the wet spells did little damage to grain, but it has been unfavourable to the proper ripening of peas and red-clover crops.—*J. G. Scott.*

ASHBURTON.—Rain fell on ten days during the month, a total of 1.83 in. Frost was recorded on five nights. The highest reading of the thermometer was 86°. Most of the crops are now cut, and harvesting is general. Record crops of oats are spoken of on the light plains land. The wet season suited this class of land. There is now an absolute assurance of good winter feed of turnips and grass.—*C. Branigan.*

FAIRLIE.—The weather has not been favourable for harvesting, but it cleared up during the last week of the month. Farmers are very busy getting their crops harvested. There is every promise of a splendid yield throughout, and what has been stacked has been got in in splendid order.—*W. B. Manning.*

WAIMATE.—Somewhat unsettled weather and frequent showers have been the general weather conditions during the month. A considerable area is now safely in stack, and should the weather of the last week continue for a few days longer the bulk of the grain in this district will be safely harvested. As crops on both light and heavy lands are noticeably heavy, a record yield may be expected. Root crops are looking well,

and peas, beans, and linseed are of splendid growth. Lucerne, which is daily receiving more attention, is looking well. Present indications show that farmers are becoming to realize what a remunerative forage plant this is. Potatoes, although a little blight may be seen, are doing well. Maize in the more sheltered spots looking all right. Pastures are looking much better than usual for this time of the year, and there is every prospect, on both light and heavy country, of an abundance of feed for stock to last for some time to come.—*F. A. Macdonald.*

KUROW.—The weather continues very showery and unfavourable for harvesting-operations, causing great loss of time to threshing-mill owners, where threshing out of the stook is in vogue. Some of the wheat and barley is very discoloured owing to the continued spell of wet weather, while the grain is not as hard as it should be. Farmers also complain about their crops ripening very unevenly, some patches being quite green, while the remainder is dead-ripe. As far as the crops are concerned, they are the best that have been reaped for years.—*G. Reid.*

OAMARU.—February was rather showery till the last week, and, in consequence, harvest-operations were greatly retarded. However, better weather now prevails, and is enabling farmers to get their crops in. Rust and smut is more prevalent this season than for a number of years. Root crops of all kinds promise to be exceptionally good. Prospects for winter feed are very bright.—*S. M. Taylor.*

PALMERSTON SOUTH.—The weather was fine from the 1st to the 5th, but from the 6th to the 24th it was unseasonable, cold and squally, with frosts, with an occasional warm day. The Kakanui Ranges were twice capped with snow. A complete change took place at the end of the month—bright warm days and ideal harvest weather. Harvesting is now general, and is being pushed on with vigour. Late-sown crops, wheat principally, are yet very green, and will require the best of weather to ripen. The Hessian fly has done more damage in wheat crops than was at first supposed. Pastures are very good, and present a pleasant contrast to the corresponding month of last year. Root crops have a good show of tops, but bulbs are not making the growth one expects at this period.—*C. S. Dalgliesh.*

DUNEDIN.—The weather during February was cold, wet, and windy, with occasional frosts. Many farmers are only thinning their turnips now, as these were not put in until January on account of the wet weather. The crops have been laid down by the heavy rains and have been twisted by the high winds, which makes harvesting difficult. Mangel crops are a failure, and in most cases have run up to seed. Turnip crops will be very light. Potato crops are light all over. The pastures are exceptionally good.—*J. R. Denton.*

TAIERI.—The weather was wet and cold on eleven days. This did a good deal of damage to the white crops, beating some of the crops down. The harvest is general throughout the district. Some are threshing out of the stook. The mangels have been a failure owing to too much wet. Turnips are looking well—better than they have been for many seasons.—*H. McLeod.*

MANIOTOTO.—Have had only a few days' real heat this season. Rain has been general, with a few nights' frost. Last month rain fell on twelve days and frost on six nights. Stock in general is looking well. Pastures are excellent, and crops in general are satisfactory, except potatoes, with which frost has played havoc. Fruit will give a poor return.—*A. T. N. Simpson.*

OWAKA.—The weather for this month has been changeable; all kinds of weather in the one day. In portions of the district it has not been so bad, but in other parts there have been nearly three weeks rain out of the four. Harvesting-operations are being carried out in some portions of the district; but owing to rain all crops that have been cut are in the stook, and others that are backward are beginning to lie down. The small-bird pest is proving very disastrous to crops. The weather now seems to have taken up. It will mean a lot to the farmer if it does.—*Thomas D. Urquhart.*

LAWRENCE.—The rainfall for the month was 2.86 in. The weather was of a very varied description, and very cold at times. In a good many cases turnips, where sown early, ran to seed and are being fed off. Late-sown turnips will generally be only a very light crop. A good many patches of wheat and oats are lying down. The harvest will not be general for at least another month. The last few days have been very warm, and is just what is wanted to bring the crops to maturity.—*R. Barron.*

CLYDE.—A changeable month. There were some very warm days, also extremely cold ones, with frost and snow on the mountains. The country is looking well for the time of the year, and there is good feed on the high country. Stock of all kinds are in good fettle, and the crops are very good.—*T. N. Baxter.*

THE FRUIT CROP.

OFFICERS of the Orchards, Gardens, and Apiaries Division report as follows on the condition of the fruit crops in February:—

WHANGAREI.—Warm and dry weather prevailed almost throughout the month. Welcome heavy rain on the 29th instant. Up to the present very little appearance of bitter-rot, but a slight appearance of bitter-pit in Spys and Lord Wolseleys. Vegetables very much affected by dry weather.—*J. W. Collard.*

AUCKLAND NORTH.—First half month dry and warm, latter end more rain than usual; a fairly seasonable month for fruit. Peaches very plentiful, prices ruling low. Pears good supply, scab rather prevalent owing to wet weather, prices fair. Apples, supply heavy, late varieties being marketed before maturity, thus adding to glut. Japanese plums, heavy supply, nearly over. English plums, average supply, prices kept down by Japanese plums. Potatoes, good supply, prices fair. Outdoor tomatoes, crop below average.—*W. C. Thompson.*

AUCKLAND SUBURBS.—Commencement of month pointed towards hot dry spell, but intermittent with warm and sometimes hot weather. Useful rains during latter half of month. Prices for fruit generally very low, owing to glut Japanese plums on the market; these are now practically done, so moderate advance in values may be expected. Peaches good crop, but flavour, owing lack of sunshine up to Christmas, has been poor. Apples and pears coming in heavy supplies, and crop of late varieties will be heavy.—*W. R. L. Williams.*

HAMILTON SOUTH.—Weather-conditions have been more favourable for growth of fruit this month, and apples, peaches, and late pears have shown great improvement, heavy crops and good quality fruit being assured. Plum crop has been very heavy, consequently prices have been low—so low that some growers have been letting them drop to waste. Early peaches and nectarines are done, and crop was only light to good. Potatoes turned out better than expected, and medium crop will be dug.—*N. R. Pierce.*

WANGANUI.—Fruit prospects as reported last month are well maintained. While, in consequence of rain, early apples suffered in many orchards from scab, later kinds are finishing better. Gravenstein and Cox's Orange Pippins looking very well. Peaches, though lacking in quantity, have been of excellent quality, Kalamazoo and Sea Eagle Improved carrying crops that promise well. Plums have been a glut on the market, but later varieties of good quality now securing better prices. In the vegetable garden, owing to good growing weather, the excellent promises of the past are being realized.—*W. C. Hyde.*

PALMERSTON NORTH.—Reports on crops from various parts of district are satisfactory. Windy weather about middle of month did considerable damage to peaches and softer varieties of apples. Pears showing exceptionally well, with indications of good crop. Later varieties of peaches good, and tomatoes grown outside are maturing well with warmer weather.—*G. Stratford.*

HASTINGS.—Hawke's Bay fruit crop very good, and fully up to expectations of last report.—*J. A. Campbell.*

BLenheim.—Apples generally throughout district show good crops, also pears. Stone fruit is now nearly off the trees, with exception of nectarines and late peaches. Tomatoes rather backward owing to climatic conditions, nevertheless they show fair crop. Severe high wind on 21st thrashed many apples and pears from trees, but this was quite local, as damage is not reported as having been done outside Blenheim.—*E. Rabbits.*

NELSON.—Fruit crop on the whole very satisfactory, although black-spot this season is causing a little trouble.—*J. L. Williams.*

CHRISTCHURCH.—Apples have come on well during month, late varieties especially showing up. Crop should be fair to good, mostly first-quality fruit, and free of blemishes. Pear crop medium to light, but in some instances pear-scab rather troublesome. Stone fruits almost over; crops generally have been light and return good, peaches having realized high prices. Tomatoes out of doors are ripening badly, and crop light. Small fruits done, crops having been good. Walnuts promised from fair to good, but in instances they are dropping off trees with disease.—*W. J. Courtier.*

TIMARU.—Fruit crop on the whole satisfactory, and up to expectations.—*J. H. Thorp.*

DUNEDIN.—Apples, few early varieties coming forward, later main crop looking well. Pears, some good lines of early sorts being picked. Excellent specimens of apricots and peaches are coming to hand. Good lines of prunes and plums in markets. Grapes looking well. Main crops of all fruits in this district very backward in ripening owing to unseasonable weather experienced, which still continues.—*W. T. Goodwin.*

HONEY PROSPECTS.

THE Director of Orchards, Gardens, and Apiaries Division has received the following reports on the honey-crop prospects from the Apiary Instructors:—

AUCKLAND.—North Auckland—Very fair, so far. Waikato—Poor; only half crop. Thames Valley—Half crop; possibly will improve, as the pennyroyal is plentiful here. Te Awamutu—From reports received there are indications of a fair crop. Owing to the late season the honey generally will be of a superior quality than the usual.—*G. V. Westbrooke.*

WELLINGTON.—East Coast—Much below the average. West Coast—Little or no surplus. Taranaki Province—Much below the average all through. Hawke's Bay and Poverty Bay—A very poor honey crop is being gathered there this season.—*F. A. Jacobsen.*

CANTERBURY.—Present conditions for honey crop are poor. We cannot expect any honey unless better weather-conditions are experienced.—*E. G. Kenny.*

OTAGO.—There is every indication that the honey crop in Otago and Southland will be small, possibly the smallest on record for many seasons past. Extracting has not yet commenced in many districts, but where a start has been made returns are very unsatisfactory. In the bush districts the returns are better, but not up to the average. The bush honey is of indifferent flavour, dark, and does not meet with ready sale.—*E. A. Earp.*

The High Commissioner reports that the Swiss Federal Council has temporarily reduced the duty on frozen meat from 25 francs (1 franc = 10d.) to 10 francs.

Mr. George W. McMullen, of Picton, Ontario, is experimenting with a new milk-product that he says will take the place of butter and cheese. Butter utilizes only $4\frac{1}{2}$ lb. of the 13 lb. of solids contained in every 100 lb. of milk. Cheese absorbs only 8 or 9 of the 13 lb. The new product, as yet unnamed, takes up the entire 13 lb., leaving no waste, and is declared to be more palatable than either butter or cheese. It is considered possible that the discovery may revolutionize the world's dairy industry.—*J. A. Ruddick, Dairy and Cold Storage Commissioner of Canada.*

ANSWERS TO CORRESPONDENTS.

MILK-TESTING.

D. F. B., Hollywell, Totara, writes,—

Would you advise me through the *Journal*,—

1. Which is the most satisfactory way of taking a milk test—drip or dip?
2. Which is the most popular way of testing in North Island factories?

The Director of the Dairy Produce Division replies,—

1. I may say that both the dip and drip methods of taking a sample of milk for testing purposes are considered correct, provided the milk is thoroughly mixed. Repeated tests have been made to show that there is practically no difference between a “dip” and a “drip” sample. The pouring of the milk into the weigh-can is quite sufficient to thoroughly mix the contents, and if a dip is taken out immediately afterwards the sample should be quite a representative one.

2. The Babcock method is practically the only one used in the North Island, and in nearly every case samples are taken by the dip method. Milk-testing by the Babcock method was fully dealt with by Mr. Gwillim, Dairy Instructor, in the *Journal* of August and September last.

 CLUB-ROOT.

G. J. HAMILTON, Clayton, Fairlie, writes,—

I have a plot of garden, a fifth of an acre, on which last summer the cabbage tribe was badly affected with club-root. This year I have it all in mangels. I want to know how much ground lime I should apply this autumn to the plots, and what artificial manure, and how much I should apply next spring? I want to grow all sorts of vegetables—including cabbage—on it next summer. I have no farmyard manure available for it. The land is light silty loam. Kindly answer in the *Journal*.

The Director of Orchards, Gardens, and Apiaries Division replies,—

The application of heavy dressings of lime, 4 to 7 tons per acre, is the most effective means of clearing land of club-root. It should be worked in some considerable time before the land is to be cropped. It is very important that all diseased material from infected crops should be burnt. Club-root can also be suppressed by a careful rotation of crops. Mangels, carrots, potatoes, &c., can be grown in soil infected with club-root without any danger, but plants of the brassica order, such as turnips, cabbage, rape, swedes, &c., will succumb to the disease if planted in such ground. The land may not require any manuring at present, but if it does the application at the rate per acre of 2 cwt. of superphosphate, 1½ cwt. of bonedust, ¾ cwt. of sulphate of ammonia, and, if the soil is deficient in potash, 1 cwt. of muriate of potash should give good general results.

 ENSILAGE AND PHALARIS COMMUTATA.

MR. EDWARD EGGLESTON, Anama, writes,—

In your *Journal* for January, page 8, concerning your article on ensilage, you mention how the temperature is ascertained, which may range between 130° and 150°; but how is this maintained and regulated? A description and measurements of your

Manitoba hay-stacker would be of considerable assistance to those contemplating ensilage-making.

Phalaris commutata.—I have grown half an acre of this seed, and it promises so well that I intend sowing with other grasses. Is there anything of the nature of twitch about it, and is it easily eradicated when the ground is again required for cultivation?

The Director of the Fields and Experimental Farms Division replies,—

Reference to the leaflet and to the *Journal* will show that the temperature of the stack is lowered by an increased weight. This is secured by stacking a greater quantity of material (grass, maize, oats, &c.) of which the stack is being built. If the temperature is rising too high add 6 ft. to the stack if it be nearly completed, put on the remainder of the crop, then the framing at the top, and add the earth to provide the weighting. If the heat is insufficient, leave the stack with but slight addition of weighting-material. A wide range of temperature can be permitted usually without serious damage to the value of the ensilage.

The Manitoba stacker consists of two masts or poles stayed with wires. These poles are connected with a wire rope to a pulley on the ground, from which is actuated an automatic fork. There are no measurements to supply.

Phalaris commutata is not yet sufficiently cultivated to warrant an authoritative opinion. It has every promise of being a useful forage plant; it is not so sure that it may satisfactorily form part of a pasture. It does not appear likely to be difficult of eradication, or that it would become an obstacle to cultivation. A report on the correspondent's experience with this grass would be appreciated.

FRUIT-PRESERVING.

J. McK., Featherston, writes,—

Would you kindly advise me if nectarines can be preserved the same as apricots or peaches, and, if so, give me particulars of the procedure.

The Orchards, Gardens, and Apiaries Division replies,—

Yes, nectarines can be preserved in syrup, either in bottles or tins, in the same way as apricots or peaches. For this purpose the syrup can be made of varying strength or density to suit the taste of the consumer.

Strength of Syrup.

6 lb. sugar to 1 gallon of water	..	..	Very heavy.
4 lb. " "	..	..	Heavy.
3 lb. " "	..	..	Medium.
2 lb. " "	..	..	Light.
1 lb. " "	..	..	Very light.

The water should be brought to the boil, sugar added, and allowed to simmer for seven to ten minutes, care being taken by frequent stirring to prevent burning. All scum that forms on the surface should be carefully skimmed off. The fruit should be prepared and placed in the tins or bottles, syrup added, and submitted to sufficient heat to sterilize the fruit and syrup without overcooking the fruit, and hermetically sealed as soon as possible—i.e., while the rising steam prevents the air from coming in contact with the syrup or fruit.

On large estates in Spain the sheep are divided into what are termed cabanas, or huge flocks of about 10,000 head, each being directed by a Mayoral or Merino, who has fifty shepherds under his command. The breed of sheep in western Spain is called the merino, after the name of the chief shepherd, and they are now famous the world over for their wool.—*Journal of the British Board of Agriculture.*

SHIPMENTS OF PRIMARY PRODUCE FROM NEW ZEALAND TO UNITED KINGDOM.

COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.	Mutton, Carcases.	Lamb, Carcases.	Beef, Quarters.	Butter, Boxes.	Cheese, Crates.	Wool, Bales.	Wheat, Sacks.	Oats, Sacks.	Rabbits, Crates.	Hemp, Bales.	Jow, Bals.	Kauri- gum, Cases.	Sundry.
January, 1912	237,284	302,399	12,424	114,512	61,005	95,994	..	..	7,295	6,365	1,942	3,407	59 carcasses pork.
" 1911	175,337	287,120	13,568	90,405	46,375	127,199	..	16	399	15,234	3,302	7,094	590 "
February, 1912	208,424	273,246	13,052	101,544	62,398	106,074	607	..	..	6,831	1,615	1,056	..
" 1911	242,090	450,406	24,924	86,368	46,667	70,030	23,694	200	..	4,428	1,302	2,113	1,369 carcasses pork.
March, 1911	264,297	665,822	26,657	45,912	40,068	58,362	40,276	..	..	3,650	1,583	8,982	2,408 carcasses pork.
" 1910	222,058	413,179	22,134	77,319	42,029	64,266	2,899	3,636	..	9,152	2,490	2,959	798 "
April, 1911	172,503	491,413	19,106	14,823	33,411	42,917	38,456	6	..	9,233	1,827	2,517	2,431 carcasses pork.
" 1910	209,120	559,166	29,355	46,524	44,032	32,920	21,855	1,934	12	10,179	2,951	4,250	627 "
May, 1911	204,390	377,105	20,173	995	20,732	33,033	93,854	..	..	7,443	1,210	7,720	1,087 carcasses pork.
" 1910	310,196	622,232	38,276	9,588	28,384	25,123	81,052	..	3,010	10,017	2,346	3,150	1,293 "
June, 1911	214,079	448,432	15,789	..	6,323	19,568	39,422	..	14,128	4,763	525	5,528	2,434 carcasses pork.
" 1910	299,596	555,777	60,286	485	17,963	21,260	13,707	..	8,988	6,180	2,684	2,104	658 "
July, 1911	206,869	260,761	14,296	..	276	14,100	29,452	..	10,334	6,022	1,073	2,786	175 carcasses pork.
" 1910	249,906	334,753	71,160	..	595	12,816	20,604	1,106	8,649	6,695	1,437	8,272	2,448 "
August, 1911	66,603	110,054	3,653	..	..	5,260	31,976	..	18,231	3,443	303	3,475	203 carcasses pork.
" 1910	94,468	97,899	16,440	634	..	5,351	33,970	273	22,629	1,378	720	6,793	362 "
September, 1911	102,081	40,057	6,059	6,404	..	7,390	38,151	..	33,059	5,604	393	7,672	220 carcasses pork
" 1910	104,925	26,416	8,420	22,644	41	6,539	40,876	3,803	7,721	2,680	597	1,682	255 "
October, 1911	9,417	2,043	100	49,626	11,501	2,182	..	..	32,094	4,514	754	2,982	..
" 1910	49,010	800	10,551	60,014	9,159	3,189	94,815	23,330	36,947	3,632	1,232	3,089	56 carcasses pork.
November, 1911	47,770	10,427	403	135,741	57,319	44,934	15,833	..	16,006	7,844	2,183	3,085	..
" 1910	62,996	29,877	5,554	105,759	27,749	55,551	76,594	331	38,446	6,850	2,300	4,339	911 carcasses pork.
December, 1911	72,192	91,965	765	109,397	46,883	54,297	..	..	4,366	5,719	1,364	2,708	..
" 1910	82,405	157,172	13,155	182,051	67,162	59,080	..	..	9,716	4,594	109	5,363	686 carcasses pork.

HEMP AND TOW GRADING RETURNS.

FEBRUARY, 1912.

Hemp.—The total number of bales graded was 9,291, as compared with 8,897 for the corresponding month of last year, an increase of 394 bales. For the twelve months ending 29th February, 1912, the number of bales graded was 85,512 as compared with 125,655 for the previous twelve months, the decrease being 40,143 bales.

Tow.—During the month 2,737 bales were dealt with, as compared with 3,476 for the corresponding month of last year, a decrease of 739 bales.

HEMP AND TOW GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF FEBRUARY, 1912.

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.	Common.	Rejected.	Condemned	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland	193	502	35	..	4	734
Napier	107	..	..	..	..	107
Foxton	1,583	2,556	76	9	..	4,224
Wellington	84	2,257	1,187	110	23	..	3,661
Blenheim
Pictou	95	70	..	..	..	..	165
Lyttelton
Dunedin	52	25	15	..	..	..	92
Bluff	32	245	31	..	..	308
Totals	231	4,267	4,505	252	38	4	9,291
Percentages of total	..	2.59	45.91	48.69	2.8	0.01	..	100

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	199	78	12	289
Napier ..	..	55	..	..	55
Foxton ..	180	760	98	123	1,038
Wellington ..	257	544	125	..	1,049
Blenheim ..	..	..	..	..	..
Pictou ..	46	..	9	..	55
Lyttelton ..	..	78	..	..	78
Waikuku ..	42	..	9	..	51
Dunedin ..	..	14	..	..	14
Bluff ..	..	24	83	1	108
Totals ..	525	1,674	402	136	2,737

STOCK EXPORTED.

FEBRUARY, 1912.

THE following table shows the numbers and descriptions of stock exported from the Dominion:—

Port of Shipment.		Horses.				Cattle.	Sheep.			Swine.
		To Australia.	To Pacific Islands.	To Singapore	To England.	To Pacific Islands.	To Australia.	To Pacific Islands.	To South America.	To Pacific Islands.
Auckland	..	5	34	..	4	25	..	204	..	42
Gisborne	..	..	..	..	..	..	..	..	..	..
Napier	..	..	..	..	..	..	..	..	..	..
Wellington	..	98	..	..	..	..	1	..	..	..
Lyttelton	..	23	..	..	..	..	187	..	..	..
Dunedin	..	37	..	1	..	..	132	..	..	..
Bluff	..	36	..	..	..	..	..	..	..	..
Totals	..	199	34	1	4	25	320	204	..	42

The following are particulars of the horses shipped: 82 draughts (19 stallions, 31 mares, 14 geldings, 18 colts), 66 half-draughts (30 mares, 36 geldings), 33 mixed draughts (1 stallion, 12 mares, 20 gelding-), 26 thoroughbreds (7 stallions, 19 mares), 1 hackney mare, 21 light horses (18 mares, 3 geldings), 8 ponies (1 stallion, 3 mares, 4 geldings), 1 racehorse gelding.

STOCK IN QUARANTINE.

THE following stock was received into quarantine during the month of February:—

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
MOTUIHI ISLAND (AUCKLAND).					
2	Jersey heifers	Female ..	Fortuna, California	F. A. White	.. Auckland.
SOMES ISLAND (WELLINGTON).					
1	Cocker spaniel	Male ..	London ..	S. Johnson	.. Palmerston North.
QUAIL ISLAND (LYTTELTON).					
1	Collie dog ..	Male ..	London ..	H. Little ..	.. Woodgrove, Christchurch.

PRODUCE IMPORTED.

THE following return, compiled by the Customs Department, shows the total importations into New Zealand during the month of February of agricultural and farm products :—

Item.	Quantity.	Value.
		£
Bran	tons	..
Butter	cwt.	..
Cheese	5 cwt.	37
Chaff	tons	..
Fresh fruits, all kinds	2,044,412 lb.	13,848
Barley	centals	..
Oats	2 centals	1
Wheat	centals	..
Onions	493 cwt.	144
Pollard and sharps	tons	..
Potatoes	1 ton	5
Seeds, grass and clover	3,332 cwt.	14,871
Total values imported .. .. .	..	£28,906

ARGENTINE TRADE WITH BRITAIN.

THE Department has received the following cablegram from Buenos Aires, dated 6th March, 1912 :—

“ The following shipments of produce were despatched from the Argentine to the United Kingdom ports during February, 1912 (compared with February, 1911) :—

	1912.	1911.
Frozen beef (quarters)	150,000	106,168
Chilled beef (quarters)	164,000	129,141
Frozen mutton (carcases)	261,000	113,606
Frozen lamb (carcases)	73,000	27,236
Butter (cwt.)	12,296	1,300 ”

CONDEMNED MEAT IN BRITAIN.

THE Port of London sanitary committee has accepted a tender for the disposal of unsound meat, &c., for the year 1912 at the following prices: Fat brisket beef, &c., £7 per ton; beef body, body meat, veal, ox-tongues, cheeks, &c., £5 per ton; sheep, lambs, pigs, pork, bacon, hams, &c., £7 per ton; tinned meats, £3 per ton.—*High Commissioner for New Zealand*, London, 12th January, 1912.

THE BRITISH PRODUCE MARKET.

HIGH COMMISSIONER'S CABLED REPORTS.

THE Department of Agriculture, Commerce, and Tourists has received the following cablegrams from the High Commissioner for New Zealand. (NOTE.—Quotations, unless otherwise specified, are average market prices on spot.)

London, 17th February, 1912.

Mutton.—The market is quiet but steady. A small supply of New Zealand. Canterbury cannot be quoted; North Island, 4d. per lb.

Lamb.—The market is quiet, and likely to go lower. Other than Canterbury, 5½d. per lb.

Beef.—The market is firm, owing to reduced supplies. New Zealand is not quoted.

Butter.—The market remains firm. A good demand continues. New Zealand butter is giving satisfaction to buyers, and prospects are favourable. The Continent requirements are larger than expected. Average price for the week for choicest New Zealand 132s., Australian 129s., Danish 135s., Siberian 129s., Argentine 128s., per cwt.

Cheese.—The market is quiet, on account of high prices. Holders are firm. New Zealand cheese is giving satisfaction to buyers. White 72s., coloured 71s. 6d., per cwt.

Hemp.—The market is steady, but without animation. New Zealand good-fair grade, spot, £21 5s., fair grade £20 5s., fair current manila £21 10s., per ton. Forward shipment: New Zealand good fair £21 10s., fair grade £20 10s., fair current Manila £21 10s., per ton. The output from Manila for the week was 20,000 bales.

Cocksfoot-seed.—The market is quiet, but holders are firm. Buyers are not keen to do business. Bright clean New Zealand cocksfoot-seed weighing 17 lb. per bushel, 75s. per cwt., nominal.

Kauri-gum.—The market is quiet, but steady. 174 cases offered, 80 sold. Stock on hand, 376 tons. Dark-brown selected rescraped £6 to £7 10s., three-quarter scraped £4 5s. to £4 15s., chips, drossy £1 10s. to £1 15s., rescraped pale amber £10 to £12, three-quarter pale scraped £7 to £8, diggers' chips, good, £2 5s., per cwt.

Hops.—The market remains firm. English £13, Californian £12.

Wool.—The market is quiet—prices slightly weaker. Current quotations for Bradford tops: 36's low crossbreds 1s. 0¾d., 40's low crossbreds 1s. 1d., 44's medium crossbreds 1s. 1½d., 50's half-breds 1s. 5d., 56's quarter-breds 1s. 7½d., 60's merinos 2s.

London, 24th February, 1912.

Mutton.—The market is quiet, prices slightly weaker. A fair demand continues. Output is satisfactory. North Island 3¾d. to 4¾d. per lb. (according to quality).

Lamb.—The market is dull, owing to a poor demand. Have sufficient supplies to last for present requirements. Canterbury 5¾d. per lb., North Island are freely offered at an average of 5¾d. per lb. for best quality, 4¾d. for secondary, Australian 4½d., Plate 4¼d., per lb.

Beef.—The market is quiet; small business doing. Chilled hinds 4½d., fores 3d. per lb.

Butter.—The market is quiet, but firm. A feeling of apprehension prevails, however, on account of the strike that is threatening the coal trade. The average price for the week for choicest New Zealand is 132s., Australian 128s., Danish 138s., Siberian 129s., Argentine 127s., per cwt.

Cheese.—The market is quiet, but steady. Prices are firm and unchanged. New Zealand white 72s., coloured 71s. 6d., per cwt.

Hemp.—The market is quiet but steady; very few offers from the Dominion. Prices are more or less nominal, at about quotations already given. New Zealand good-fair grade, spot, £21 5s., fair grade £20 5s., per ton. Forward shipment: New Zealand good-fair £21 10s., fair grade £20 10s., per ton. Fair current manila, spot, £21 15s., per ton. Forward shipment: Fair current manila, £21 10s. per ton. The output from Manila for the week was 32,000 bales.

Cocksfoot.—The market is firm, but little doing. Danish is quoted at 77s. per cwt. ex warehouse. Buyers are holding back until they know what the prospects of the crop are on the Continent.

Wool.—There is a better demand for merinos and coarse crossbreds at the last rate quoted.

London, 2nd March, 1912.

General.—The coal strike is now on, and affects the market very seriously. The market is very depressed. The second series of Colonial-wool sales arranged for the 5th instant will be postponed.

Mutton.—The market is weak; there is a dull sale for heavy carcasses. Canterbury 4½d. (nominal), North Island 3½d., per lb.

Lamb.—The market is quiet. Canterbury 5½d., other than Canterbury 5d., per lb.

Beef.—The market is dull. Stocks of New Zealand beef on hand are light; cannot be quoted.

Butter.—The market is lifeless; a poor demand. The average price for the week for choicest New Zealand butter is 129s., Australian 125s., Argentine 125s., Danish 137s., Siberian 127s., per cwt.

Cheese.—The market is firm; there is a good demand. The average price for the week for finest New Zealand cheese is white 72s. 6d., coloured 72s., per cwt.

Hemp.—The market is steady, but demand only moderate. New Zealand good-fair grade, spot, £21 10s., fair grade £20 10s., per ton. Forward shipment at the same price. Fair current Manila, spot, £21 10s., per ton. Forward shipment: Fair current Manila £22 per ton. The output for the week for Manila was 13,000 bales.

Wheat.—The market is firm, owing to reduced supplies. New Zealand long-berried wheat, spot, ex granary 38s. 6d., short-berried, 37s. 6d., per quarter of 496 lb.

Oats.—The market is steady, with a very good demand. New Zealand oats, short sparrowbills, ex granary, spot, 26s. 6d., per quarter of 384 lb. (nominal).

Beans.—The market is firm, owing to reduced supplies. New Zealand beans, f.a.q. (old crop), 38s. (nominal), per 504 lb.

Peas.—The market is quiet, with a tendency in favour of buyers. New Zealand peas (partridge) 38s. (nominal), per 504 lb.

POULTRY AND PIG PRODUCTS.

London, 7th February, 1912.

Eggs.—The market is firm, owing to reduced supplies from Continent caused by cold weather. Home 13s. to 15s., Dutch 11s. 6d. to 15s. 9d., French 11s. 6d. to 16s. 6d., Hungarian 11s. to 13s. 6d., Egyptian 9s. to 10s. 6d., Assyrian 10s. 6d. to 12s., Moroccan 11s. 6d. to 12s., Danish 13s. to 17s. 6d., Italian 15s. to 17s., per 120.

Poultry.—The market is quiet, but steady. Chickens: Home 8½d. to 10½d., Russian 8d. to 9½d., per lb. Ducklings: Home 8½d. to 10d., Russian 7½d., per lb. Turkeys: French 9d. to 11d., Continental 8d. to 9½d., per lb.

Bacon.—The market is firm, with hardening tendency. There is more demand. Stock is small. Sides: Irish 55s. to 66s., Danish 50s. to 60s., Continental 44s. to 58s., Canadian 48s. to 55s., per cwt.

Hams.—The market is dull; very little business doing. Tendency is downward. Irish 80s. to 100s., English 84s. to 102s., American 50s. to 56s., Canadian 56s. to 60s., per cwt.

London, 27th February, 1912.

Eggs.—Recently, with small supplies coming forward and a good demand, the prices have been unusually high for this time of year. Expect supplies will increase this week and lower rates will have to be accepted. Home 15s. 6d., Dutch 13s. 6d. to 15s. 6d., Assyrian 12s. to 14s., Moroccan 11s. 6d., French 12s. 6d. to 13s. 6d., Danish 13s. to 15s. 6d., Italian 13s. 6d. to 15s. 6d., Egyptian 9s. 3d. to 10s., per 120.

Poultry.—The market is quiet; small business doing. Chickens: Home 9d. to 10d., Russian 8d. to 9d., American 9d. to 11d., per lb. Ducklings: Home 10d. to 1s., Chinese 5½d. to 6½d., Russian 5½d. to 6½d., per lb. Turkeys: French 9d. to 10½d., Continental 8d. to 9d., per lb.

Bacon.—The market is quiet, but steady; the consumption lately has been satisfactory, and prices are firm. Sides: Irish 58s. to 68s., Danish 56s. to 64s., Continental 50s. to 61s., Canadian 55s. to 60s., per cwt.

Hams.—The market is dull for Canadian and American, and for English and Irish a good demand at steady rates. English 84s. to 102s., Irish 86s. to 100s., Canadian 56s. to 66s., American 50s. to 54s., per cwt.



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CONTAGIOUS ABORTION AND FAILURE OF
CONCEPTION IN DAIRY COWS.

C. J. REAKES, D.V.Sc., M.R.C.V.S.

PART I.—CONTAGIOUS ABORTION.

CONTAGIOUS abortion in dairy cows has for years past proved a source of great trouble and of considerable loss to the dairy-farmer, particularly in certain districts, and though, fortunately, the number of cases met with in the Dominion has been very much fewer of late, the fact of the disease still being present renders it necessary for every owner of dairy cows to keep a careful watch for the first possible indication of abortion in its contagious form, and to promptly take the right steps to check the spread of infection among his herd. It would be a mistake to assume that the cessation of trouble from this disease, almost complete in some districts, indicates that it has been stamped out. It is one of its characteristics that after prevailing on a farm

or in a district for some years it will apparently die out, only to reappear again after a varying interval of time. At the same time there can be no doubt that the thorough manner in which farmers, following the advice of the Government Veterinary Staff regarding preventive and curative treatment, have tackled contagious abortion has been the most important factor in bringing about the present comparatively satisfactory state of affairs; and the measure of success gained should be an incentive to further and even more thorough work directed against it.

The leaflet written by Professor Gilruth, the first edition of which was published in 1902, and the second in 1905, has proved of the utmost value in the work of combating the disease; and the thousands of copies of this which have been distributed have been the means of saving for the dairying community many thousands of pounds of income from cows which, but for the adoption of the advice contained in it, would have proved, for a season at any rate, wholly or partially unprofitable.

In that leaflet contagious abortion and sterility were coupled together as two phases of one and the same disease; but later experience has shown that while on the one hand these two troubles undoubtedly often arise from infection by the specific organism of contagious abortion, on the other hand many cows fail to hold to the bull from quite distinct and separate causes. Therefore, while still dealing with the two conditions in the one leaflet I intend to treat them separately, but in so doing to incorporate much of the matter contained in the previous leaflet.

THE CAUSE.

The cause of contagious abortion is the action of a specific organism which is found in the womb of cows after aborting, and is also present on the "cleansing," and in the discharges which come away with the imperfectly matured calf and afterwards. Dr. Bang, of Copenhagen, first discovered this particular germ, and by cultivating it artificially outside the animal body was able to produce the disease experimentally. The later work done by the Committee appointed in Great Britain has fully confirmed this.

It will be well here to draw attention to the necessity for realizing that while the possibility of contagion being responsible should never be lost sight of there are many other causes which may produce abortion in individual cows. Among these may be enumerated the following: Constitutional weakness, anæmia, serious disease of one or more of the internal organs, acute indigestion, undue exposure of weak-constituted cows to inclement weather, &c. Ergot is often blamed, but the extent of its influence is doubtful.

MEANS BY WHICH INFECTION IS SPREAD.

Cows in calf are likely to abort if they are permitted (1) to come into contact with an animal that has recently aborted, or (2) to come into contact with an aborted foetus, or (3) to eat food material contaminated with the discharge of a cow that has aborted. This may occur through grazing in paddocks in which cows have aborted or have been allowed to run, after abortion, before all discharges from the womb have ceased. The necessity for care in this respect is shown by the result of the investigations carried out by the British Committee on Contagious Abortion—viz., that cows could be infected by administering to them, by the mouth, cultures of the contagious-abortion organism, this giving good reason to believe that cows taking into their system grass or other growing food contaminated by the discharge from an aborted cow would by so doing become infected.

Another fact also proved by the work of the professional men who carried out the experimental work for the Committee was that abortion may not occur for some months from the time when the infective material was introduced into the system of the cow. In the case of ten animals which were experimentally infected, the average period at which abortion occurred after infection was 126 days, the shortest period being 33 days, the longest 230 days.

SYMPTOMS.

When abortion proper is about to occur in a cow far gone in calf no symptoms sufficient to attract attention are as a rule exhibited. Occasionally evidences of uneasiness and attempts to apparently prepare for calving may be observed, but generally the event occurs with no premonition to the owner.

TREATMENT.

1. Whenever a cow actually aborts search immediately for the foetus (*i.e.*, the aborted immature calf) and destroy it by burning it on the spot where it lies, using kerosene, if necessary, as an aid to ensure complete destruction. If this is not feasible the foetus should be buried deeply. When burying a foetus care should be taken, when filling in the hole, to first throw in the soil removed from the ground surface.

2. Thoroughly dig up the ground on which the foetus has lain, together with an area of, say, 3 yards on every side of it, and saturate the surface with a liberal quantity of a non-poisonous sheep-dip or other safe disinfectant.

3. Isolate the cow and keep her isolated for four weeks, using a temporary bail, if necessary, for milking purposes. Meanwhile apply

treatment by irrigation as described hereunder. Never allow a recently aborted cow to enter a yard or milking-shed.

4. Where several cows in a herd abort, or keep returning to the bull, it is found to be absolutely necessary, in order to prevent the spread of the trouble and to ensure its complete eradication, that not only these cows but every cow in the herd should be treated, and this treatment should be applied to the entire herd at the one time.

5. In all cases the bull should be treated.

6. No newly purchased bull which has done previous service should be allowed access to the cows until he has been properly irrigated; and no newly purchased cow should be admitted to the herd, or to service by the bull, until she has been thoroughly washed out with one of the antiseptic solutions described herein.

MATERIALS REQUIRED.

The treatment recommended in the previous leaflet consisted of the use of a solution of mercuric chloride (corrosive sublimate), and there can be no question as to its efficacy. Its one drawback is the excessive irritation it produces at the time of application, and experience has shown that the substitution of other antiseptics, for instance, lysol, Jeyes' fluid, Lawes' fluid, or izal, has given good results, and these preparations are certainly far less irritating than is corrosive sublimate, though their relative value as germ-killers is less. But the one thing to be remembered and acted upon is that *whatever material is used the irrigation must be carried out thoroughly and properly in every detail*. If care be taken to ensure this, any of the preparations mentioned above will prove effective. In using mercuric chloride the most convenient form in which to obtain the drug is to get it in so-called "soloids"—flat circular pellets, each containing a given quantity (8.75 grains), such as are prepared by Messrs. Burroughs, Wellcome, and Co.

The strength of the solution of mercuric chloride to be used is as follows:—

- (a.) For cows which are repeatedly returning to the bull or are apparently sterile, 1 in 2,500. This can be conveniently prepared by dissolving one pellet in two ordinary (clear glass) whisky-bottlefuls of water, which has been boiled and allowed to cool to about blood-heat.
- (b.) For a bull a solution of the same strength (1 in 2,500) should be used.
- (c.) For cows which have just aborted a weaker solution (1 in 5,000) should be used, and applied once daily for three successive days, and at weekly intervals afterwards if there be any dis-

charge from the vagina. This solution can be made by dissolving one pellet in four whisky-bottlefuls of water.

- (d.) For in-calf cows more than three months pregnant which are to be treated as a preventive measure, the solution 1 in 5,000 (as in paragraph c) should be used.

Unless in the case of an actually aborted cow, one application only of the mercuric-chloride solution is necessary if properly carried out. Lysol should be used in a solution of 1 part in 80 of water, and Izal Jeyes' or Lawes' fluids in a 1-in-60 solution.

In order to carry out irrigation it is necessary to provide a 3 ft. length of thick indiarubber tubing of $\frac{1}{2}$ in. diameter, and a small funnel, which, if intended to be used with a corrosive-sublimate solution, must be made either of glass or enamelled metal. Neither the mercuric chloride nor its solution must on any account be allowed to come into contact with plain-metal, by reason of its strong chemical action on such material. Also, for use in the treatment of the bull, an ordinary enema syringe with vulcanite fittings should be obtained.

THE METHOD OF PROCEDURE IN TREATING COWS.

1. Boil for five minutes the tube with the funnel inserted into one end, and then apply to the outside of the tube a dressing of salad-oil or good lard.

2. Wash the hands and arms thoroughly in hot water to which a disinfectant has been added.

3. In the case of a newly aborted cow, pass the free end of the piping by means of the hand gently into the womb or, if treating an in-calf or sterile cow, as far up the vagina as possible without undue force being used—taking care not to injure the lining-membranes. During insertion the curve of the tubing is better turned downwards.

4. Hold the outer end of the tubing with the funnel about 6 in. above the root of the cow's tail.

5. Pour the solution as described gently into the funnel, and so thoroughly irrigate the parts. If the fluid does not run fairly freely from the tube, the inner end need only be moved gently to and fro to secure a free flow. The intention is to thoroughly irrigate every portion with the solution.

6. Thoroughly wash down the parts from the root of the tail to the bottom of the udder, also the underside of the tail, with some of the same solution as that used for irrigating.

7. If the cow is rugged, thoroughly cleanse the hinder border of the rug, also the straps attached to it, using the same solution for this purpose.

THE METHOD OF PROCEDURE IN TREATING A BULL.

Place the animal in a crush-pen, or otherwise secure him in such a manner that he may be readily handled without danger. Then grasp the prepuce (or sheath) by the left hand and pass the nozzle of the syringe inside the sheath, afterwards holding it in position with the same hand. Then with the right hand pump into the sheath a quantity of the solution sufficient to thoroughly irrigate the parts.

MERCURIC CHLORIDE.

Note.—In using mercuric chloride be certain that the whole of the pellet is thoroughly dissolved before using the solution, as any undissolved particle lodging on the lining membrane of the vagina or womb will cause intense irritation.

Caution.—In connection with the use of mercuric chloride it must be remembered that it is a highly poisonous drug if swallowed, and therefore every care should be exercised in order to prevent accidents.

PART II.—FAILURE OF CONCEPTION IN DAIRY COWS.

Considerable trouble is experienced at times by farmers through the failure of cows to conceive, or, as it is commonly termed, "failure to hold to the bull"; and it is a fact that this often occurs in a herd where contagious abortion is present, and this has led to the opinion being formed that it is in some way the result of infection by the same specific organism. Certainly it is undeniable that careful and proper irrigation of the genital passages has generally resulted in the cows holding to the bull after the next service, provided care has also been taken to properly apply an antiseptic wash to the bull's organ. Sometimes, however, the trouble has persisted in spite of treatment; but here it has not unfrequently been found that the treatment has not been properly carried out. In empty cows, unless quite newly calved or aborted, the tubing used cannot be easily introduced through the neck of the womb, except where the animal is in season, when it becomes considerably relaxed. (Then, however, it is not advisable to irrigate, especially with mercuric-chloride solution.) The farmer, after locating it, should endeavour to carefully dilate it with his fingers (which must be thoroughly clean) and then guide the end of the tube through it. The opening can be detected easily by its structure—it feels like a sort of small rosette of fleshy leaves with the opening in the centre. I would emphasize the necessity for the hand and arm being thoroughly clean, and, farther, that the finger-nails be short and no dirt of any kind present beneath them.

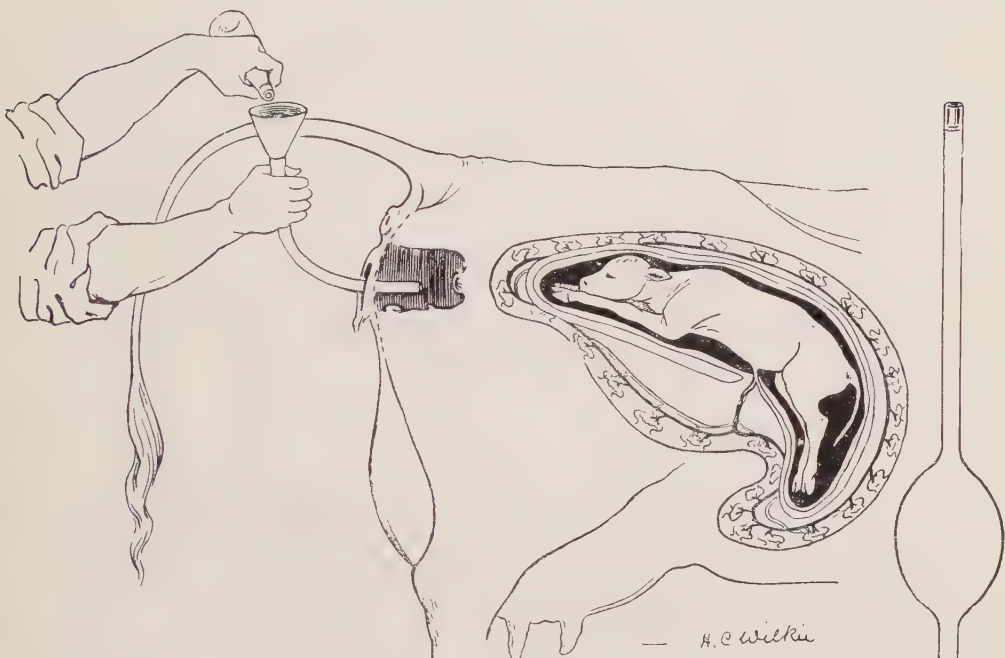


DIAGRAM SHOWING METHOD OF IRRIGATING VAGINA OF COW AS
A PREVENTIVE OF ABORTION.

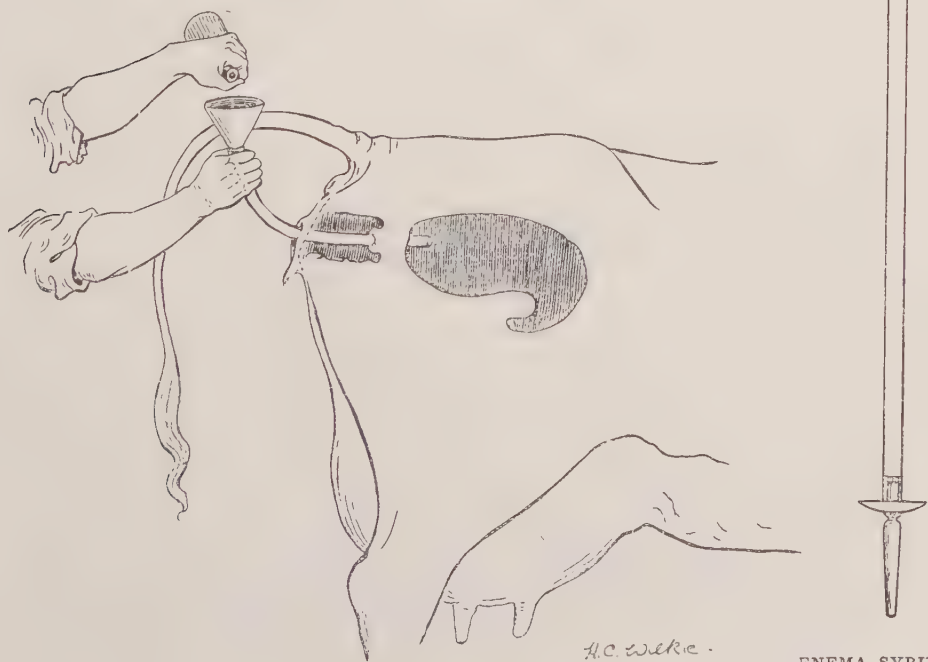


DIAGRAM SHOWING METHOD OF IRRIGATING WOMB OF COW
WHICH HAS ABORTED.

ENEMA SYRINGE
FOR IRRIGATING
SHEATH OF BULL.

It will usually be found, however, that it is practically impossible to pass the tubing through the orifice. In such event the following procedure should be adopted: Thoroughly wash out the vaginal passage with an antiseptic solution. This should be done a day or two before the cow is expected to come in season; and it often proves successful. For this purpose one of the following may be used: Mercuric chloride, 1 part in 2,500 of water (one tabloid in two whisky-bottlefuls); Lysol, 1 in 80; Jeyes' fluid, Lawes' fluid, or Izal, 1 in 60.

It sometimes happens that failure of conception is occasioned by an undue secretion of acid fluid from the lining membrane of the parts, and that an alkaline wash is then all that is needed. The treatment necessary is to irrigate the passage just before service with a solution composed of 5 oz. of bicarbonate of soda (baking-soda) in half a gallon of warm water. This has often proved successful and is especially recommended when no cases of abortion are present in the herd and there is nothing to suggest that the contagion of this disease is responsible for the animal's failure to conceive, and none of the possible other causes mentioned later are present. No harm can be done if this irrigation by soda-bicarbonate solution is carried out in addition to the antiseptic irrigation—while it will probably do good.

That the bull, by acting as carrier of infection from cow to cow, is often an important factor in disseminating trouble among the herd is clearly shown by the practical experience obtained, and, so far as circumstantial evidence can go, indicates that many of those numerous cases of failure of cows to conceive which cannot be attributed to venereal disease or to his being overworked, and consequently rendered temporarily impotent, are the result of infection of the cow by the specific organism of contagious abortion. It may be that the presence of this organism has the effect of destroying the virility of the spermatozoa; or, what is more likely, that the presence in the womb of the organisms which cause abortion has the effect of producing a catarrhal condition of the lining membrane which prevents conception taking place. It is an undoubted fact that trouble of this kind has persisted when the owner, though carefully irrigating all his cows, has omitted to treat the bull, but has disappeared when this omission has been rectified, and the entire herd, including the bull, has been treated. Hence, when cows fail to hold, the bull should always be treated, the procedure being the same as that recommended in the earlier portion of this article dealing with contagious abortion.

But it is evident that a large number of cases exist in which bad management on the part of farmers is really responsible for failure of conception in some of their cows or heifers. The too-prevalent practice of allowing the bull to run at large with the cows results in the animal

becoming stale and overworked, as a consequence either of his having too many cows to deal with, or of his unnecessarily frequent attentions to individual cows. This is especially the case when, as is too commonly observed, young bulls often only two years old are used. It is far better to provide a special small paddock for the bull, and to bring the cows to him as they become ready, removing them again when properly served.

One not unfrequently observed cause of failure of cows to conceive lies in the improper use of mercuric-chloride solution in irrigating the vagina, or this or other strong antiseptic solutions immediately before service. At least forty-eight hours should elapse between the time of irrigation and the time of service, and it is better to carry out the irrigation just before the cow is expected to come in season.

Another cause of failure to get in calf from time to time met with is an attack of septic metritis (inflammation of the womb) caused by the entrance of septic germs at or very shortly after the time of calving, sometimes caused by the cow not cleansing properly. Though the cow apparently recovers, the clinical symptoms disappearing—with sometimes the exception of a slight discharge from the vagina, often overlooked by the owner—some weeks, perhaps months, may elapse before the womb thoroughly regains its normal healthy condition. In cases where a cow has suffered an attack of septic metritis it is advisable to wait three months at least before allowing her to go to the bull, and, further, to irrigate her at intervals with a mild antiseptic solution, as, for instance, an ounce of lysol to a gallon of warm water.

A still further cause of the trouble is to be found in the existence of a form of venereal disease in bulls, the male organ becoming much swollen and inflamed, often with abscesses forming in its tissues. Bulls so affected should never be allowed to serve cows, and when trouble occurs through cows failing to conceive it is always a wise precaution to note the condition of the bull's organ and ascertain whether there is anything wrong with it.

Finally, it is absolutely necessary, if successful results are to be hoped for, either in dealing with contagious abortion or failure of conception, to *carry out the treatment exactly and thoroughly.*

The *pellets*, "*soloids*," or so-called "*tabloids*," mentioned in the article, can be obtained from the Live-stock and Meat Division of the Department, Wellington, post-free, at a cost of 3s. per hundred, 2s. for 50, or, if required in small quantities, at 6d. per dozen. They are also kept in stock by the majority of chemists.

The funnel and tubing are also supplied post-free, at a cost of 3s. 6d. (funnel 1s., tubing 2s. 6d.); also suitable syringes at a cost of 9s.

RED - TOP.

A. H. COCKAYNE.

RED-TOP and its allies, commonly known in English husbandry as "bent-grasses," are rapidly becoming popular with New Zealand farmers for certain types of land on which the best pasture grasses and clovers are not a success. There are three main species of bent-grasses naturalized in New Zealand—red-top (*Agrostis vulgaris*), white-top (*Agrostis alba*), brown-top (*Agrostis canina*). These various species are in many cases more or less closely connected with intermediates; and the number of these, all of which probably reproduce themselves true from seed, render the accurate determination of them a matter of great difficulty. Over twenty varieties of *Agrostis vulgaris* have been described, and an equal number of varieties of the other two species have been given botanical names.

Red-top (*Agrostis vulgaris*) is distinguished from the other two by not having long creeping stems, and having a very short ligule at the base of the leaf. White-top (*Agrostis alba*), included in which is fiorin (*Agrostis alba* var. *stolonifera*), is characterized by creeping stems, with leafy branches developed at the nodes; oblong sometimes acute ligules, as long as broad, often torn at the edges; and rough leaf-sheaths. The panicle is also less open than in either *Agrostis vulgaris* or *Agrostis canina*. Brown-bent is distinguished from the other two by possessing awned seed. It has acute ligules closely resembling those of *Agrostis alba*. It is impossible to tell the various species from the seed alone, and samples purporting to be one particular species may and often do contain numerous distinct forms.

Most of our European seed is sold as "fiorin," while American seed is nearly always quoted as "red-top" (*Agrostis vulgaris*). In New Zealand two types of seed are on the market, Matakana red-top, largely consisting of *Agrostis vulgaris*, and Waipu brown-top, which is mainly *Agrostis canina*. Both of these grasses take their names from the districts in which the seed is saved. They are becoming very popular in many parts of northern Auckland, as they are both extremely permanent in character and form a thick sward. Their herbage, if allowed to get away, is rather unpalatable, and for this reason *agrostis* pastures have to be well eaten down to give the best results. The bent-grasses for preference grow naturally in heavy swampy land, but



FIORIN.



RED-TOP.

they will also succeed well in light land *provided the annual precipitation is over 40 in. per annum*. They do not tolerate drought, and for this reason their use in Europe and America is often deprecated whenever a dry summer has been experienced, while a moist summer invariably leads to an increase in their cultivation. A special feature of the bent-grasses is that they produce a large amount of herbage in the late autumn.

It must be borne in mind that the bent-grasses are not first-class ones, and their cultivation should be eschewed on those soils where the highest-class grasses and clovers are successfully grown. There are, however, very large areas, especially in the North Island, where the so-called first-class grasses are a comparative failure, and on these the various forms of red-top and brown-top must occupy a very important position in pastures. The pumice lands of the great inland volcanic plateau form a case in point. On this at present almost unutilized area the bent-grasses will be in all probability the most valuable that can be employed. As has been mentioned, the bent-grasses vary enormously, and there are without doubt numerous forms which, if selected out and bred, would produce a very much better class grass than those now sold under the various names of "fiorin," "red-top," and "brown-top."

I do not think there is another group of grasses in which there are more latent possibilities for the plant-breeder, and work in this direction should have as its consummation the production of excellent pastures on soils that are at present ranked as virtually useless.

SEED FOR SOWING.

THE selection of plump and well-ripened seed for sowing is a great advantage. In each seed is laid up a store of food to be used by the young plant in the early stages of its growth. In a shrivelled seed the store which can be drawn on is very meagre, and the growth under such circumstances is slow; but in a well-developed and plump kernel the supply is abundant, and the plant starts out with a degree of vigour which is usually maintained, and the resulting crop, all other conditions being equal, is usually satisfactory. —*Mark Lane Express*.

During the last few years, says a London *Times* correspondent, a number of Argentine insurance companies have been doing profitable business in insuring crops. Last year dividends up to 65 per cent. were paid to shareholders—in fact, the profits were paid away in dividends. Up to three weeks ago these companies were issuing policies right and left. Then the rain began. They are now mostly all in a state of bankruptcy. The big ones may save their existence by making compositions with their creditors; the small ones will disappear.

ENSILAGE.

PRIMROSE MCCONNELL.

LIKE everything else under the sun ensilage is nothing new. Ancient writers tell of a form of preserving green fodder in pits. The importance of ensilage is to a great extent determined by climatic conditions. In the North American States, where it has become very popular, the winters are so severe that it is next to impossible to store an appreciable quantity of roots, and hence their place as a winter fodder is now almost entirely filled by ensilage. Going to the other extreme of climate, in such countries as Australia, where the farmer has to contend against periods of prolonged drought, ensilage is, in the opinion of the writer, of the utmost importance, and is the only means of providing a succulent fodder when all other cattle-food is absent, except in districts where lucerne can be successfully grown. In tropical and semi-tropical climates ensilage should undoubtedly be held in reserve for periods of drought.

The question arises whether the provision of silos for ensilage is of vital importance to New Zealand? My own opinion is that in many districts it is not. I would like to make it very clear, however, that I am making no attempt to "throw cold water" on this valuable system of preserving fodder. Twelve years ago I made ensilage in silos on an extensive scale in England, and proved to my own satisfaction that some of the arguments brought to bear against it had no foundation. In New Zealand, where labour is scarce and dear, and in instances where all labour has to be hired, it is my opinion that the place of ensilage may be filled by other fodders at a much less cost. We are blessed with a climate that is not only conducive to the successful cultivation of roots but also to the growing of green fodder all the year round, and for the latter reason in particular ensilage will never become so popular or so necessary as it is in the countries mentioned above.

It is more than probable that many farmers are labouring under the mistaken idea that ensilage can take the place of hay during the winter months, and possibly this idea has given ensilage a lift into favour in New Zealand that it otherwise would not have had. No other fodder can take the place of good hay, although good hay—especially lucerne hay—can successfully fill the place of many other winter fodders. The indiscriminate use of ensilage during the winter months has been the cause of considerable loss to the dairy-farmer.

In some instances cows have been actually physicked to death. Such instances in no way condemn ensilage, or lessen its value as a dairy foodstuff, but serve to illustrate that it is a food that must be handled with considerable judgment.

I think no practical farmer will contend that the value of a ton of ensilage approaches that of a ton of good hay. My own experience is that a ton of good hay is worth several tons of ensilage; possibly the dairy-farmer's opinion is too easily influenced by the *immediate* effect of a foodstuff, and not by the effect it may have later on.

In such low-lying districts as this (Ruakura Farm), where the winters as a rule are wet, ensilage should be used with much care; and, seeing that mangels and hay can both be successfully grown, also green winter forage, I would strongly recommend that ensilage be used in periods of drought only, when the dairy-farmer will find it of very great value. Not to take roots into consideration, green fodder can be provided in winter at much less cost than ensilage, and with equally good results otherwise.

Many statements that have been published, giving the cost of ensilage-production, are not quite clear to me; and, for my own part, I have never been able to grow an ensilage crop, stack, and feed it, at the low cost per ton that is generally given. Nevertheless, all dairy-farmers will do well by providing a stack of this useful fodder, and keeping it in reserve for a droughty time, for they can undoubtedly feed it at such times at much less cost than the price of artificial foodstuffs.

Strange to say, this fodder has never made much headway in Britain, and this may be explained, to some extent, by the fact that the growing of a root crop is looked upon as being an essential item in the programme of intensive farming; possibly the importance of this item is not sufficiently recognized by some New Zealand farmers. For several years after its introduction the British farmer looked upon ensilage as a certain means of tainting his dairy-produce and otherwise lowering its value. I proved to my own satisfaction that this idea, although warranted under certain circumstances, was the result of ignorance as to the proper method of feeding. When fed immediately after milking, and none allowed to remain in the cow-shed, the resulting dairy-produce will be found to be excellent, and free from any unpleasant flavour.

The smell of some classes of ensilage is also a stumbling-block to many farmers ("It sticketh closer than a brother"); but this may no doubt be minimized by keeping the ensilage from coming in contact with the clothes and hands. I may state that I have known good farm hands who absolutely refused to handle this class of fodder.

In the matter of ensilage-making my own custom was never to make ensilage when I could make good hay, and never allow good hay or other fodder to spoil when I could make ensilage. I filled the silos during wet weather, and, although the work was laborious in the extreme, I never regretted it.

When other winter forage is abundant ensilage should not be given to cows as a kind of luxury, but reserved for times of scarcity, particularly droughty periods.

When lucerne-growing becomes more popular in New Zealand we shall no doubt follow the example of the United States and make a portion of the hay into meal, which, if fed in a moist state, will fill the place of roots or other succulent fodder, not only for cows but for all classes of farm stock, including poultry. As to lucerne hay, the New Zealand farmer, generally speaking, has not yet realized its value, and no class of green fodder makes better ensilage.

To bring the cost of ensilage-production as low as possible, the silo, the chaffcutter, and blower are essential, and also the close proximity of the paddock in which the ensilage crop is grown. To the latter end it would be better to have a paddock immediately surrounding the silo, and which would be used year after year for the growing of silage crops. These could then be swept up to the cutter, and the whole process carried out at a comparatively small cost. Where silos are not erected on the above lines the stack system is undoubtedly the best, even although the waste is considerable.

No doubt ensilage may be made from any green fodder, or even weeds that are not absolutely poisonous; but it is surely a mistake to expect as good results from weeds and general rubbish as would be obtained from, say, maize and lucerne, or maize and tares. It would be just as reasonable to expect as good hay from tussock-grass as from lucerne.

Stack ensilage is somewhat different. During the past season a stack containing somewhere about 70 tons of oat-sheaf ensilage has been made at this station. I may confess, however, that the oats were cut in the green stage with the object of making hay; but, a period of wet weather setting in, I was compelled in self-defence to resort to ensilage.

I trust no one will infer from anything I have stated above that I do not recognize the value of ensilage, particularly ensilage in emergency stacks, to the dairy-farmer; at the same time, as far as the New Zealand farmer is concerned, he may provide other fodder which will take the place of ensilage, and the cost of which, in labour and money, will be much less. As a means, however, of preserving fodder that would otherwise go to waste, it cannot be too highly recommended.

ROBINIA PSEUDO-ACACIA.

B. C. ASTON, F.I.C.

THERE now seems little doubt that the cause of death of the foals mentioned in the last issue was the Robinia, as was then suggested by me. A further search of the literature available has disclosed the fact that several such cases have occurred in America, and have been undoubtedly caused by the ingestion of Robinia bark. The undermentioned authorities give three instances in which the most decided symptoms of poisoning were manifested by the animals after they had eaten the bark. In two cases the horses had been tied up to Robinia trees, and had employed the time by peeling off the bark and swallowing it. The symptoms were anorexia and stupidity, intensely dilated pupils, pronounced palpitation of the heart, ropy urine, very yellow mucus membrane, paresis of the bowels, capillaries congested, inability to hold the head upright (Walden, *American Veterinary Review*; Pammel, "Manual of Poisonous Plants"; *Breeder's Gazette* for 1909).

I have to thank Mr. A. H. Cockayne, Biologist, for the above references.



ENSILAGE STACK AT MOUMAHAKI EXPERIMENTAL FARM.

THE above stack is composed of between 60 and 70 tons of lucerne, which is estimated to yield over 50 tons of prime ensilage. The lucerne was cut and stacked at a time when it was impossible to make hay, as rain fell daily. Had the material not been converted into ensilage the crop would have been wasted. The cost of making the stack was about £18, or slightly under £3 an acre of material employed. As the yield of lucerne was 11 tons 15 cwt. per acre, the cost is equivalent to 5s. per ton.

THE LAMB EXPORT TRADE.

ARGENTINE COMPETITION.

C. J. REAKES, D.V.Sc., M.R.C.V.S.

WHEN the Argentine first began to come into prominence as a mutton-producing country it was believed by most people interested in the development of the export trade from that country to Great Britain that the export of lambs in any quantity was an impossibility. This belief was apparently based largely upon the opinion that English grasses could not be grown in the country with any degree of success, as neither could such food plants as rape, turnips, &c., and it is a fact that until recently no appreciable quantity of lambs was exported. It is now stated, however, that the enterprising and progressive Americans who have established themselves in the Argentine have proved that lambs can be exported, and it is believed that the trade will continue to increase. Should this increase assume considerable proportions it may in time have the effect of at least steadying, if not reducing, the values in the London market of both Australian and New Zealand lamb, or at any rate of all but our very best grades.

It may be that the hopes apparently held as to the extensive development of the Argentine lamb export trade are too optimistic, and are incapable of fulfilment, and there are not wanting good judges of the position who hold that this is the case; but "Forewarned is forearmed," and New Zealand producers should spare no effort in doing everything possible to maintain the premier position they now hold in the lamb trade.

It is worthy of note that, notwithstanding the disabilities under which the Argentine producer labours, the export of lambs from that country has steadily increased year by year since 1907, last year especially showing a great advance. Note the following figures of the lamb carcasses exported to Great Britain:—

1907	..	127,106	} from all parts of South America.
1908	..	322,928	
1909	..	634,496	
1910	..	515,048	
1911	..	890,865	from Argentine.
1911	..	175,801	from other parts of South America.

Shipments of lambs from Argentine for the following four months :—

		1911.	1910.
October	.. ..	38,989	18,000
November	.. ..	117,430	67,000
December	.. ..	144,500	95,600
January, 1912	.. ..	75,500	72,000 (1911)
		— — —	— — —
		376,419	252,600

In this connection a reliable correspondent in London makes the following remarks :—

The figures show a decided increase in the shipments, and, although not sufficiently large to *control* the market, the quantity, combined with fairly regular supply, and the fact that some of the lambs are of a decent quality, enable the Americans to sell in such a way as to keep down the price a bit. For instance, this season, although supplies have not been excessive, Australians have been fetching something like 3d. per pound less than last year, and the only reason assigned for this is that the Argentine people can go on selling their own stuff at a price never quite up to the Australian. As to what effect larger supplies would have on New Zealand lamb it is difficult to say. The earlier arrivals of Argentine lambs were of good quality, but they did not enter into competition with New Zealand, as few of the latter were on the market. The Argentine lambs arriving now are much plainer, and, if they do not improve, we need not fear them this season.

To summarize, the position is this : On the one hand we have people who say that a big lamb export cannot be developed ; on the other we have the Americans, who are confident to the contrary. I am inclined to agree with the latter. Actions speak louder than words. The figures given certainly substantiate their opinion. In the past the quality of the Argentine lambs has not been very good, and therefore did not compete to any extent with New Zealand. Each season, however, an improvement is noticeable, and should this improvement continue, and at the same time the numbers greatly increase, I am afraid that in the Argentine we would have a formidable competitor.

This information cannot be ignored, and the position, though as yet open to argument as to the extent to which our trade may be affected in the future, is one which should receive the careful consideration of all sheep-owners. Especially is this the case with those on small holdings, who may be tempted to utilize for lamb-production old ewes of inferior class, and cheap underbred rams. If we are to ensure the continued maintenance of our present position in the market we must not only take care that the standard of quality of the lambs exported is kept up, but that every effort is made to raise it, as time goes on, to a higher and more uniform level.

The South-eastern Railway Company of England was recently fined £100 and costs for cruelty to pigs and sheep by overcrowding them in a railway-truck. Twenty-eight sheep and twenty-two pigs were crowded into a truck 15 ft. 6 in. by 7 ft. 6 in., and on arrival at their destination three were dead.

A M A N G E L - D I S E A S E .

A. H. COCKAYNE.

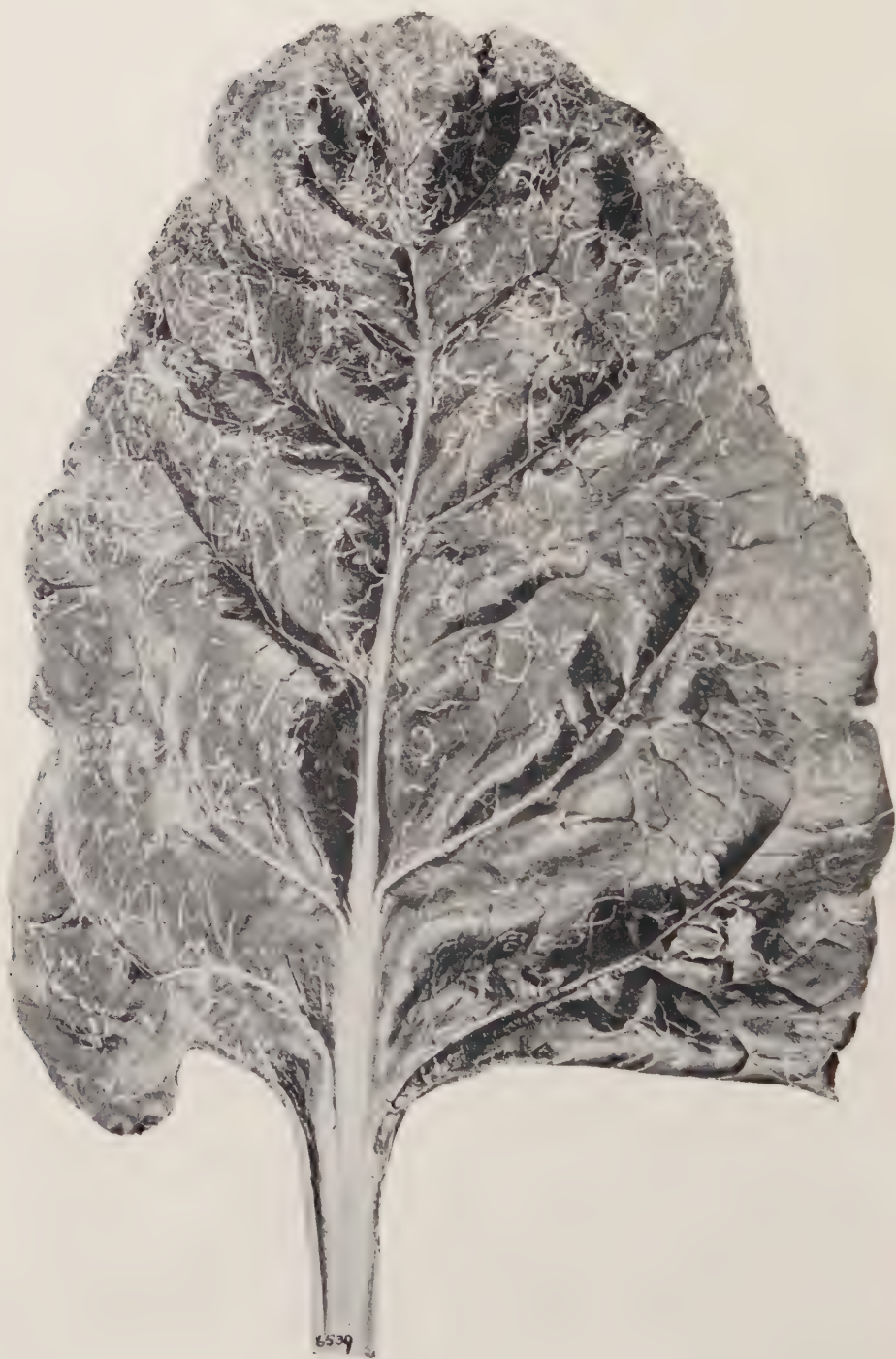
A. MACPHERSON, Fields Instructor for the South Island, sends the following note regarding a disease present in some of the mangel experimental plots:—

“On inspection of co-operative field experiments at Belfast Freezing-works on the 20th instant I found the leaves of the twenty-seven varieties of mangels grown badly attacked by a small dipterous larva. Very few of the leaves of any of the varieties were free from the ravages of the pest, and those badly affected had a shrivelled appearance. Consequently, the growth of the root will be severely checked if the damage to leaves continues.

“The silver-beet also is attacked, but at present to a less degree than the mangels. The plants are strong and the leaves average 26 in. in length. Sheep will be put on to this plot at once, and the leaves eaten off.

“The soil on which the experiments are carried out is a heavy clay loam on a clay subsoil. The land was in grass for years prior to 1908. In 1909 a potato crop was grown; 1910 in peas; 1911 present experiments, for which purpose the land was ploughed in August last and received thorough cultivation prior to sowing the seeds, and abundant intercultivation during the growth of the plants.”

This disease was at first thought to be caused by the European mangel-fly (*Pegomyia betae*). An examination of specimens, however, showed that the leaves were damaged by a leaf-miner which in its effects closely resembles the well-known cineraria-fly (*Phytomyza nigricornis*). Flies which had emerged were sent to W. W. Froggatt, Government Entomologist of New South Wales. The specimens were, however, unfortunately destroyed before they could be critically examined, but Mr. Froggatt informed me that he considers the insect to be a species of *Phytomyza*. The illustrations which appear on the following pages give a clear idea of the appearance of affected leaves. I should be much obliged if any farmer who notices similarly disfigured leaves in his crop would mail me samples, that the disease may be identified. Until this has been done it is impossible to suggest any efficient methods of control with any degree of accuracy.



A MANGEL-LEAF AFFECTED.



THE DISEASE ON SILVER-BEET LEAF.

HERD - TESTING .

VALUE OF PERSISTENCY IN A DAIRY-COW.

W. M. SINGLETON.

THE accompanying illustration is of a cow which has made the record given herein under the heading of No. 1. Another cow in the same herd gave the record as under No. 2.

No. 1.	Milk. Lb.	Fat. Lb.	No. 2.	Milk. Lb.	Fat. Lb.
1st period (16 days)	.. 544	16.32	Before 1st period (17 days)	518	21.24
2nd period (30 days)	.. 1,155	42.73	1st period (30 days)	.. 915	37.51
3rd period	.. 990	38.61	2nd period	.. 930	31.62
4th period	.. 825	34.65	3rd period	.. 900	34.20
5th period	.. 675	28.35	4th period	.. 810	32.40
6th period	.. 510	23.46	5th period	.. 750	31.50
7th period	.. 255	13.00	6th period	.. 660	29.04
8th period	.. 105	5.77	7th period	.. 360	19.08
9th period (3 days)	.. 10	0.55	8th period	.. 270	13.50
10th period	.. ..	..	9th period	.. 300	15.00
			10th period (11 days)	.. 110	5.50
Totals (229 days)	.. 5,069	203.44	Totals (298 days)	.. 6,523	270.59

An examination of these figures indicates that for the thirty-day periods 2, 3, and 4, cow No. 1 gave the higher record. Some dairy-farmers seem to be of the opinion that one or two or three tests should suffice, and that extending the testing over the full milking-period is a needless work. However, the owner of these cows was not of that opinion, and both the cows were tested every thirty days during their milking-period, and with what result? Instead of cow No. 1 holding the premier position (as would have been the case had only one or even three tests been considered) the laurels easily go to No. 2, with the splendid margin of about 1,500 lb. of milk and 67 lb. butter-fat, when the whole season's production of the two cows was ascertained.

Cow No. 2 was the more persistent milker. It will be noted that after cow No. 1 had been milking 106 days (at the end of period 4) her production decreased very rapidly, and until she dried off hers was the lesser production for each and every period. Not only did cow No. 2 produce more during these months, but she milked for thirty-eight days after No. 1 went dry, although she had been milking thirty-one days before cow No. 1 dropped her calf. This gives cow No. 2 a milking-period sixty-nine days longer than cow No. 1.

The persistency of a milking-cow must receive every consideration. Some cows tested in connection with the cow-testing associations gave as much as 300 lb. fat in the season, and yet gave no more at their best month than did cow No. 1, which produced only slightly over

200 lb. fat for her season. Not only did this characteristic of lack of persistency affect the yield of this cow, but a daughter of hers was a poor dairy cow. After milking her 108 days and finding in that time that her record was only 1,095 lb. of milk and 51.76 lb. of fat, the owner sent her to the butcher. These figures show the necessity of having the special-purpose dairy cow—the sort of cow that does not start to dry off and put on beef shortly after she becomes pregnant.

It is not difficult to imagine that many dairymen might get the impression at the flush of the season that a cow such as No. 1 is about the best in their herds. This is frequently the case. It also occurs that when a bull calf is dropped by such a cow he is considered of special merit, and his life prolonged despite the fact that his sire was a



mongrel bull. The supposed good qualities of the dam overshadow all other considerations to the contrary, and this class of bull is frequently found heading a neighbour's herd. His reputation goes with him, and with pride the new owner assures us that he is from Mr. —'s best cow. Such a bull will probably be much on a par with the heifer whose record is given above. He would be about as successful in producing good milking progeny as the records indicate that the heifer was in producing butter-fat. Furthermore, it is often not only one season that he is kept to degenerate the dairy cows of the district, but for two or three years he exerts a direct influence in the downward direction, with the probability that for many more years his indirect influence handicaps many a struggling dairyman who is unfortunate enough to unwittingly have some of the inferior blood in his dairy herd.

B A R L E Y.

T. W. LONSDALE.

It is probable that barley is one of the most widely cultivated cereals; and, though at one time it was the staple bread-plant of the ancients, it is now chiefly grown for malting purposes and for stock-feeding. It is eminently adapted for cultivation in districts where oats do not flourish in equal degree, the grain forming a valuable addition to the rations of draught horses, and in many countries is the chief cereal grown for horses of all classes.

As a food for dairy cows its uses are too well known to need comment, and in Denmark oats and barley grown together are regarded as ideal fodder for milking-stock. In the production of bacon of high quality this cereal has no equal, and therefore in dairying districts its value for pig-feeding is apparent.

Numerous varieties are grown in some parts, but probably that known as "Cape" barley is most commonly grown for green fodder and feeding purposes. Malting barley is only grown to any extent in the South Island.

The illustration shows an exceptionally fine crop of "Archer's Chevalier," grown at Moumahaki Experimental Farm this season, which is estimated to yield 70 bushels per acre. The crop was grown without the aid of artificial manure. The previous crop was mangels, which were consumed on the land.

Two men have recently passed from the stage of action in Europe whose names are linked with the progress of agricultural experimentation—one an organizer and administrator, as well as a teacher, experimenter, and writer; the other perhaps the foremost investigator in animal nutrition of his time, and likewise a teacher and writer of wide influence. These men, Louis Grandeau, of France, and Oskar Kellner, of Germany, are known wherever the history and the results of agricultural investigation are known. Appreciated and honoured by the State and by their colleagues, as also by the practical farmers, the influence of their work and their writings has extended far beyond the boundaries of their own countries. Both were directors of the first experiment stations established in their respective countries, Grandeau of the Experiment Station of the East, which was founded at his instigation at Nancy in 1868 as the first station in France, and Kellner, for the past eighteen years director of the famous Mockern Station, the forerunner of all the institutions of this class.—*U.S.A. Experiment Station Record*.



THE BARLEY CROP AT MOUMAHAKI.

W H E A T B L A C K - M O U L D .

A. H. COCKAYNE.

DURING wet summers it is not unusual for the wheat crop to become quite seriously damaged by a fungus known as the wheat black-mould that manifests itself by the spotting and blackening of the ears. The very unfavourable weather that has been experienced during the past harvest has accentuated the damage done by this disease, and a considerable loss both in yield and quality of the grain is reported. The wheat black-mould is caused by a fungus known as *Cladosporium herbarum*. This genus contains many destructive plant-parasites, the tomato-rust (*Cladosporium fulvum*) and verrucosis of lemons (*Cladosporium elegans*) being familiar examples.

The wheat-mould is an extremely common fungus, and in normally dry seasons does but slight harm, being then found for the most part only on dead and decaying vegetation. It is only when there is an excess of moisture, and when diseased seed has been used, that it attacks and is able to penetrate into living plant-tissues.

Cereals of all kinds are liable to attack, but wheat and oats are the crops chiefly infested and in which the majority of the damage is done. By the layman it is noticed only when the grain is in ear, but its presence can often be detected much earlier in the season when the plants are quite small. After a comparatively dry spring followed by frequent rains the wheat-plants often assume a yellowish tint, followed by a shrivelling and bleaching of the leaves, which become covered with little blackish tufts, representing one of the spore-bearing stages of the fungus. In certain instances many of the plants are killed outright, leaving more or less circular bare or very thin patches here and there in the fields. During the past season this condition has not been unusual in Canterbury, and the cause has in many cases been erroneously attributed to the grass-grub (*Odontria zealandica*). Again, when the plants are not killed outright they may struggle on into ear, and, not having sufficient vitality to develop the grain, the stalks gradually die and become quite bleached, thus forming whitish patches that can be easily seen scattered through the crop. The main damage, in New Zealand at any rate, occurs when the ears are almost mature. The ears become spotted, and at times almost covered with blackish-olive tufts



6533

— Clean Heads. — — — — — Affected Heads. — — — — — Partially affected Head. — — — — — Wheat Black-Mould.

similar to those developed on the leaves. These tufts consist of masses of spores that germinate almost as soon as they are developed, and, provided there is sufficient moisture, continue the work of infection until the whole of the heads become completely coated with the fungus.

The mycelium of *Cladosporium* in cases of severe attack penetrates right into the wheat-grains, and flour made from them has frequently a very unpleasant flavour and its value for baking purposes is greatly impaired.

An examination of affected wheat shows that brownish patches are developed on the surface of the grains, sometimes forming quite distinct lines. When badly diseased the surface may even become cracked, due to the development of the fungus under the epidermis. Such diseased grain in many cases quite fails to germinate, and even when it does the resulting plants are always weakly, and the leaves become spotted with reddish-brown blotches caused by the *Cladosporium*.

In moist seasons *Cladosporium herbarum* is often frequent on apple-trees, causing at times quite a severe defoliation of the trees. When present on apples the fungus is often termed *Dematium puelulans*, but Jancezewski has proved experimentally that *Cladosporium herbarum* and *Dematium pullulans* are forms of the same fungus.

CONTROL.

The presence of wheat black-mould as a parasite being almost entirely dependent on weather-conditions, it is obvious that there can be no easy and effectual methods of control. Nevertheless, the damage caused by *Cladosporium* might be certainly lessened by attention to the following methods of restricting its power of infection :—

(1.) Never on any account sow seed that shows the least sign of disease. The use of affected seed will result in a diseased crop no matter whether dry or wet conditions prevail after sowing.

(2.) Avoid the growing on the same land of two grain crops in succession. An affected crop will leave the soil full of *Cladosporium* spores, which will be liable to damage any cereal crop that may be resown on the same area.

(3.) The wheat-husks from a diseased crop are capable of carrying infection. It is therefore a good practice to burn all husks, refuse, &c., as soon as threshing is completed.

(4.) In cases of very bad attack all the straw should also be destroyed by burning.

The estimated production of wheat in the Argentine this season is 91,374,000 cwt. The total production of wheat in other countries in the Southern Hemisphere is 156,000,000 cwt., or 5·5 per cent. above that of last year.

L A M B S O N R A P E

I S S H E A R I N G A N A D V A N T A G E ?

T. W. LONSDALE.

It is no doubt customary in many districts to shear lambs prior to turning them on to rape to fatten, but there is no authentic evidence to warrant this procedure. In fact, it is questionable whether there is anything gained by it.

In continuation of an experiment carried out by the writer on the Ruakura Farm last year, another trial has recently been conducted on the Moumahaki Experimental Farm. This demonstration has shown the futility of taking the result of one trial, or even several trials, as conclusive.

In order to clearly enumerate the results of the trials it is necessary to give a *résumé* of last year's experiment. "Forty wether lambs were selected on the 4th January, 1911. All were weighed after being divided into two lots, and twenty were subsequently shorn. The weight of those shorn at that date was 1,205 lb., an average of 60.25 lb. each. Those unshorn weighed 1,235 lb., an average of 61.75 lb. each. The whole of the lambs were put on to rape and allowed the run of a grass paddock adjoining. On the 28th March, exactly twelve weeks from shearing, the lambs were again weighed, the result being as follows: Shorn lot gave a total weight of 1,473 lb., an average of 73.65 lb. each; the unshorn lot weighed 1,540 lb., an average of 77 lb. each. As the lambs were weighed prior to shearing, an average of 2.6 lb. of wool being taken from each, the actual weight of the shorn lot at the commencement of the trial was 57.65 lb. each, or 4.10 lb. each lighter than the unshorn. At the end of the trial, therefore, the shorn showed a gain of 16 lb. each, and the unshorn a gain of 15.25 lb. each. There was thus a gain in favour of the shorn lot of 0.75 lb. each."

This season forty lambs were selected on the 8th January, and twenty were subsequently shorn. The two lots were then weighed and turned on to rape, having also access to an adjoining grass run. The total weight of the shorn lot was 1,222 lb., an average of 61.1 lb. each; the unshorn lot weighed 1,148 lb., an average of 61.1 lb. each. On the 19th February, just six weeks from the commencement of the test, the lambs were again weighed, with the following results: Shorn

lot, total weight 1,490 lb., an average of 74.5 lb., each thus showing for the six weeks a gain of 13.4 lb. each. The unshorn lot gave a total weight of 1,574 lb., an average of 78.7 lb. each, being a gain of 21.3 lb. for the period. The results, therefore, show a gain in favour of the unshorn lot of 7.9 lb. each.

This result is the reverse of the 1911 test, when the gain was 0.75 lb. each in favour of the shorn lot. The climatic conditions under which the two tests were conducted were entirely different: dry and hot weather was experienced throughout the 1911 test, while this season the weather has been cold, frequent and heavy rains occurring during the trial.

Judging by the results of the two demonstrations, it is evident that the question "Does it pay to shear lambs?" still remains an open one. Taken over a series of years it is probable that the result would not be a financial success.

FLAX (*L I N U M*).

WITH the object of encouraging the production of hemp from the linseed-plant within the Empire, the British Incorporated Chamber of Commerce and Shipping communicated with the Minister of Agriculture, the Hon. T. Mackenzie, expressing its willingness, should any linseed be produced within the Dominion, to have this treated in England for fibre purposes. It was pointed out that the consumption of linseed hemp was steadily increasing, and it was the desire of the Chamber to encourage production as much as possible within the Empire. If such an experimental shipment be made the Chamber undertakes to give it the very best attention, to have it examined by experts, and when dressed to have an authoritative opinion passed upon the commercial product. As the growing of linseed is receiving more attention in New Zealand, it may be that private growers will entertain the idea of testing the question of dressing the stalks for fibre. If so, the Department will arrange for a trial shipment to be made and advantage be taken of the offer of the British Incorporated Chamber of Commerce and Shipping. It may be pointed out that the steeping, cutting, and scutching of the linseed-stalks is no inconsiderable item, and the cost of these processes will have to be ascertained before any definite idea can be obtained as to the possibilities in the production of fibre from this plant.

From 1901 to 1910 there were imported into the Argentine the following purebred sheep: Lincoln, 22,985; merinos, 566; Hampshire, 1,441; Shropshire, 1,590; Romney Marsh, 1,139; various, 1,172: total, 28,893. The total value of these 28,893 animals was £378,511, or £13 2s. per head.

SOFT-CHEESE MAKING.

LITTLE WELSH.

MISS G. NEST DAVIES, N.D.D.

OF the larger varieties of soft cheese Little Welsh is one of the most popular, the taste being somewhat like a Caerphilly. The sale for it at Home is very considerable throughout the whole year, as it is a cheese which suits the majority of tastes, and is a very convenient size for a small family.

Sweet, or mixed morning and evening, milk may be used. To produce twelve cheeses 16 gallons of milk is usually employed, but more or less may be used according to the size and weight of the cheeses required. Regulate the milk to a temperature of 84° Fahr. to 86° Fahr., and add rennet at the rate of 1 dram to 4 gallons of milk. Coagulation should take place in about an hour, but the exact time when the curd may be cut must be tested in the usual way with either the finger or the thermometer. Curd-knives are used to cut the curd. After cutting, leave to stand for about five minutes. All curd is removed from the sides and bottom of the vat, and stirring is now commenced. Stir the curd with the hands for about twenty minutes, then leave to settle in the vat for ten minutes, when it will be ready to be ladled on to the cooler or drainer, in which wooden racks have been placed and a large curd-cloth. If the curd should be at all acid, do not leave to settle in the whey, but ladle on to the cooler immediately stirring is finished.

Leave to drain for a quarter of an hour, then cut into squares of about 6 in. and turn. The curd should be turned two or three times at intervals of about five minutes, when it will be ready for breaking up, which is usually done with the hands, owing to the softness of the curd.

Salt is added at the rate of 7 oz. to 20 lb. of curd, and must be thoroughly mixed with the curd. It is now ready to be filled into Camembert moulds, which are placed on draining, or finely grooved, boards. The curd must not be pressed into the moulds, but filled in loosely. After leaving for ten minutes, carefully turn the moulds (and cheese in them) over, otherwise one end of the cheese will have a rough surface.

The cheese must be turned over the next morning, and the following day, when they will be firm enough for the moulds to be removed, and be then bandaged with strong calico bandages, which are pinned

round them. These should be changed each day for the next two or three days, or until the bandages are quite dry.

The cheese should now be removed to the ripening-room, where they are turned daily until sold. Little Welsh cheese are ripe and ready for sale in about three weeks, the weight being $1\frac{1}{4}$ lb. to $1\frac{1}{2}$ lb. each, and are sold retail at 10d. and 1s. per pound; wholesale, 8d. per pound.



LITTLE WELSH CHEESE MADE AT MESSRS. D. NATHAN AND COMPANY'S WHAKARONGA FACTORY, PALMERSTON NORTH.

HERD-TESTING IN SCOTLAND.

So satisfied are the Development Commissioners of Britain that the milk-record scheme in Scotland is a sound and useful one that they have intimated their intention to make a grant of £1,000 per annum towards its extension. The administration of the grant has been intrusted to the Governors of the West of Scotland Agricultural College, but the carrying-out of the scheme will, as hitherto, be intrusted to the Scottish Milk-records Committee.

The Lancashire County Council of England has decided to extend and improve its dairy and poultry school at a cost of £10,000.

A HOUSEHOLD PEST.

A. H. COCKAYNE.

RECENTLY considerable annoyance was caused in the quarters of the Dunedin Fire Brigade Station through the infestation of certain of the rooms by immense numbers of mites. At first it was thought that the brownish-looking powder-like masses that were developed in the crevices of the walls and on the floors were the result of the ordinary wood-borer. An examination of these masses, however, showed them to consist of immense numbers of mites belonging to the cheese-mite group (*Tyroglyphidae*). It is difficult for any one except a specialist in the Acarina to name these minute animals specifically with any degree of accuracy, but the Dunedin specimens appear to answer to the description of *Tyroglyphus longior*. This cosmopolitan mite closely resembles the ordinary cheese-mite (*Tyroglyphus siro*), differing chiefly in being larger in size. It is of world-wide distribution, and has often been reported as at times quite a serious household pest, especially during the autumn months. These mites get into the cracks and crevices of chairs, doors, windows, &c., and cause great inconvenience to the occupants of houses. They often swarm in lumber-rooms, and wherever any old clothes are stored they are likely to abound. In grocery-stores *Tyroglyphus longior* is a serious pest, often causing great loss in many stored goods such as figs, currants, dates, and numberless other dried products. In seed-stores they are often a source of great trouble, especially in seeds of an oily nature, such as turnips. Stables, stores, and outhouses generally, especially where lumber has been allowed to accumulate, are favourite resorts for many species of *Tyroglyphidae*. Such places are always likely to provide infection-centres for the invasion of any dwellings near-by. A very common method of introduction is through upholstered furniture, especially that which is stuffed with either animal or the so-called vegetable horsehair. In stables they often persist for years, such localities affording an abundance of suitable food. Mites, generally *Glyciphagus domesticus*, distinguished from *Tyroglyphus* by having plumose instead of simple body-hairs, are also frequent in timber injured by the wood-borer. They appear to live with great ease on the refuse and debris formed by this beetle. This feature has been mentioned in Europe, where mites are very frequent in timber attacked by the death-watch beetle (*Anobium tessellatum*), a close relative of our white-pine borer.

LIFE-HISTORY.

The house-mites, both *Tyroglyphus* and *Glyciphagus*, deposit their eggs amongst the material on which they are feeding. The eggs are relatively large compared with the size of the adult—oval, smooth-shelled, of a dull grey and white. The egg gives rise to the so-called larval stage, which resembles the adult except that it has six instead of eight legs. The larval stage does not last long, a single casting of the skin bringing it to the third or nymph stage. The nymph resembles the adult when nearing maturity, but when young has the appearance of the larva. This is the period when the mite grows and develops its fourth pair of legs. Another curious stage exists in acarids—namely, the hypopial stage—which in the case of the household mites does not always occur. The hypopial stage is a special provision for them to be able to be more easily distributed. They attach themselves to various animals, and, as they do not feed when in this condition, they can be thus transported long distances.

CONTROL.

Many methods have been suggested for the control of the household mites, but it has been abundantly proved that sulphur in some form alone seems to affect Acarina. In dwellings, the rooms in which the mites are present should be well fumigated by burning sulphur, followed by a second application ten days after the first so as to kill those that come from the eggs. Bisulphide of carbon has also been recommended, but seems inferior in effects to ordinary sulphur. When the attack is not very bad, washing all crevices and places where the mites are likely to congregate with potassium-sulphide (1 oz. to 2½ gallons of water) will often be found quite effective. Spraying with some of the lighter emulsified oils would also, no doubt, prove satisfactory, but such treatment is only applicable to certain types of outbuildings.

It is peculiar that fumigation with hydrocyanic-acid gas, usually so efficacious against nearly all classes of insects, often gives very poor results when applied against many of the species of acarids.

With regard to the Dunedin outbreak, it is quite possible that the mites have been present in the building ever since it was erected four years ago, having come from the stable that previously occupied the site. Lack of food is probably driving them out of the haunts they have occupied up to the present, and the annoyance caused by them will in all likelihood soon abate. It would be interesting to trace the history of any furniture, chairs, cushions, &c., that may have recently been purchased, as this might throw some definite light on the origin of the infection.

APPLE EXPORT TRADE.

THE 1911-12 SHIPMENT.

THE third endeavour to test on a commercial scale the British apple-market was initiated last month, when representative consignments of apples produced in the Nelson Province were shipped to the Home market. The shipment comprised 5,493 cases of apples, eleven cases



PACKING APPLES FOR EXPORT IN A NELSON ORCHARD.

of pears, and half a case of plums, the two latter fruits being sent privately, though partly for experimental purposes. Of the apples, 5,411 cases were passed for shipment as being eligible for the Government guarantee of a 1d. per pound, net return, to the grower. The Motueka district growers provided 4,629 cases and the Nelson district

growers 864 cases. The majority of the apples which were not shipped under the guarantee were not approved for export by reason of the varieties being considered unsuitable, or on account of the apples not being of the desirable size or condition. The apples which did not participate in the guarantee were sent by growers to friends at Home. The consignments were examined by Government inspectors at Motueka and Nelson respectively. Those passed by the Inspector and participating in the guarantee bear the Government brand burned into the wood of the case.



TRANSHIPPING FROM THE NELSON STEAMER INTO THE HOME BOAT AT WELLINGTON.

Prior to and during the work of packing demonstrations in grading and packing were given by two officers of the Department. The Inspector in charge states that generally speaking the whole of the apples came to hand in splendid condition, being well graded and packed. A large proportion of the shipment was packed by Mr. Rowlands, an expert Tasmanian packer, employed by Messrs. Buxton and Co., of Nelson. In the Inspector's opinion the shipment should open well on the Home market. The varieties shipped were as follow: Jonathan, 1,389 cases; Munro's Favourite, 950; Five Crowns, 837; Alfriston, 641; Sturmer Pippin, 566; Cox's Orange Pippin, 212; Cleopatra, 206; Reinette du Canada, 143; Lord Wolseley, 141; Nonpareil Russet, 65; Rymers, 58; Cellini, 54; Washington, 35; Adams Pearmain, 28; Ribston Pippin, 22; Scarlet Pear-

main, 14; Esopus Spitzenburg, 12; Claygate Pearmain, 11; Rome Beauty, 8; Golden Reinette, 8; King David, 4; Brownlee's Russet, 3; Pioneer, 2; Allington Pippin, 1; Delicious, 1.

The apples were mostly packed a little on the green side, this being necessary in order to ensure safe carriage and the reaching of an early and profitable market. The fruit was shipped from Motueka and Nelson in small coastal steamers, which transferred the fruit into the Home boat at Wellington. In the work of transshipment trays were used instead of the ordinary ship slings, thereby preventing much of the crushing and bruising which usually takes place. In the hold of the Home boat, the "Kaipara," every care was taken to handle the cases properly and to store them in a way that would ensure safe carriage,



STOWING THE APPLES IN THE HOLD OF THE OVERSEA STEAMER.

the tiers being separated by 1 in. battens with here and there 2 in. dunnage. The chamber was specially prepared and fitted for the apple cargo, and there is reason to believe, from the interest taken in the shipment by the officers of the "Kaipara," that the fruit will be landed on the Home market in good condition. It will be carried at a temperature of from 35° to 38°. In addition to the guarantee to growers, the Government is giving a bonus of £50 to the ship provided the fruit is landed on the Home market in good condition.

CASEIN.

THE METHOD OF MANUFACTURE.

G. GNADEBERG, in "Milch-zeitung."

From the Bulletin of the International Institute of Agriculture.

IN the manufacture of casein, inorganic acids, acetic acid, rennet, or lactic acid are used. When inorganic acids are used the value of the whey is very much reduced, and this is likewise the case with acetic acid, while rennet produces a casein of lower value. There remains lactic acid. The casein obtained by this latter method is good, and the whey may very well be used for feeding pigs.

To obtain casein by the lactic-acid method, the milk, separated as perfectly as possible, is poured from the separator into a well-tinned milk-basin having a double bottom. The double bottom is necessary because it allows the temperature to be regulated by admitting steam between the two walls. To 100 gallons of milk 5 to 10 gallons of a pure culture of lactic acid prepared in skimmed milk are added, and the milk is left in the covered basin at a temperature of 28° C. (82° F.). After six or seven hours it begins to curdle, but it is not yet gelatinous in consistency; it must then be stirred with a Dutch curd-breaker. Two or three minutes later it is heated to 52°-56° C. (125°-133° F.). Under normal conditions the casein will then take the form of lumps of the size of a nut floating in the whey; if the lumps are larger the stirring has been begun too soon; if they are smaller, too large a quantity of casein is being lost. The admission of steam is then stopped, and the mass thus obtained is allowed to stand at the above temperature for five minutes; the whey is then rapidly run off, and water at 50° C. (122° F.) is poured into the basin until it covers the casein; it is carefully stirred for fifteen minutes, and finally the water is thrown away. The basin is afterwards half-filled with cold water, stirred vigorously, and the water thrown away. The washing is repeated, and the casein is pressed and drained. These operations are necessary because they reduce the ash-content of the casein. The liquid draining from the casein should be as nearly clear as possible.

After draining the casein a sort of chopping-mill ("Quarkmühle") is used to cut it up finely, and it is spread out, in as thin a layer as possible, on wooden frames covered with linen, to dry. The drying must be carried out with the utmost care, and the temperature must not exceed 50°-55° C. (122°-131° F.). Therefore a drying-chest must be used, in which the frames

are put at 5½ in. to 6 in. above one another. For 265 lb. of casein, 100 frames 28 in. by 40 in. are sufficient. For the drying a cupboard with wooden walls, and fitted with doors which close tightly from the outside, may be used, being fitted up against the wall of the room. It is best heated by means of ribbed pipes, with steam, produced by an engine, circulating inside. The moist air will be expelled when required by means of a fan. The drying must occupy eight to ten hours. It may be accelerated by turning over the casein frequently by hand.

The casein lumps, when completely dry, should contain no soft portion inside, and be bright yellow in colour. Good-quality casein should dissolve in alkalis, forming a thick, viscous mass of a non-milky character. The odour of putrefaction sometimes given off by casein when stored points to incomplete drying.

THE DEPARTMENT SECURING THE LATEST INFORMATION.

THE number of inquiries received by the Department for information in regard to casein during the past few months has proved that there is keen appreciation arising of the value of this by-product. As the manufacture of casein is quite a new industry so far as New Zealand is concerned, and recognizing that if it is to succeed it must be placed on a proper basis from the outset, the Prime Minister, after thoroughly looking into the matter, decided that the best means to this end was to secure the desired knowledge first-hand in countries where the industry is already firmly established. An officer of the Department, who has had Danish training and is a German scholar, Mr. J. Pedersen, was therefore sent at once to the Continent to make the necessary investigation. He has been instructed to furnish information by mail, so that no time may be lost in providing preliminary data as to methods employed and the plant required. Mr. Pedersen will return by the beginning of next season, and, it is expected, will be well acquainted with the latest information as to manufacture and marketing, as well as the details necessary for initiating the business on a proper footing.

In January the United States sent to Britain 3,452 cwt. of frozen pork, as against 52 cwt. for the same period of last year.

Undoubtedly, when the breed of pigs improves, as it will do, in Siberia, in the same way as in other countries, and with normal prices, there will be a great export, and people interested in the business will do well to keep their eyes upon it, as in the future bacon will probably be the second-most-important export from Siberia, and the United Kingdom will certainly be the chief market.—*Report by H.M. Vice-Consul at Omsk on Agriculture in Siberia.*



CHOU MOELLIER ON THE TOTARA ESTATE, OAMARU.

THE HEMP INDUSTRY.

W. H. FERRIS.

THE hemp which came forward for shipment in March was generally of a gratifying quality, a big increase in the proportion of good-fair quality being noticeable. Better stripping was the chief reason for the improvement, while there was a noticeable increase in the amount of good-coloured hemp. Better scutching was also observable. Even millers turning out fair hemp have been producing a better article than usual, the bulk of the lines of this being pointed high. The good weather, of course, contributed to the better work accomplished, ideal bleaching conditions being experienced during the greater part of the month.

The millers of the Manawatu continue to work at high pressure, and are steadily extending their operations, the while progressive methods are being adopted. At present values the business is apparently proving profitable where a good supply of phormium is available within easy distance.

There is an impression abroad that unless certain improved types of strippers are employed it is impossible for millers to reach a good-fair grade. This is quite erroneous. As a matter of fact, the milling of a superior article depends more on the expertness of the stripper-keeper than on the machine he is working. I have seen and graded some of the best hemp produced which has been stripped by an old-style machine, with a stationary beating-bar, while I have handled a most disappointing fibre stripped with one of the most up-to-date stripping-machines on the market. The great advantage of the stripper having a spindle which will "give" is that it is not so likely to injure the fibre when an excessive amount of leaf is fed into the machine. Given proper management better work can certainly be done with the improved stripper than with the old-time form, while an increased output is thereby made possible.

Tow continues to be a very payable by-product. To the uninitiated it may be explained that in scutching phormium-fibre—holding the stripped and bleached hanks (a collection of about fifteen stripped flax-leaves) against a rapidly revolving skeleton wooden drum—all short adhering fibres and extraneous matter are removed. These fall behind the machine, and, after being well shaken, to remove any rubbish and dust, constitute what is technically known as "tow." In reality tow comprises some of the finest

fibres of the phormium-plant, and is highly esteemed by manufacturers where length of fibre is not essential. Before the advent of tow-grading millers did not take the necessary care to remove extraneous matter, and in consequence of being exported in an unsatisfactory condition the product fell into much disfavour—in fact, a payable market connection for it was lost. With grading, and a consequent guarantee of quality, a good demand for tow has arisen, buyers having confidence in the quality exported, and are finding such good uses for it that the supply is not equal to the demand.

Another by-product of the industry, stripper-slips, is also being improved. In only a few cases, however, are millers paying the attention to the get-up of this hitherto waste material that they should. These more progressive men are not only drying it properly but are teasing it in a scutcher, to free the fibre and get rid of the bulk of the extraneous matter. Others, however, are sending the slips forward in a very unsatisfactory condition.

The improvement in output and quality referred to above is practically confined to the Manawatu. At Auckland and Southland the fibre being submitted for grading is generally unsatisfactory. A few millers in the latter district, however, are turning out a fairly good article—in one or two cases high-pointed good-fair and even fine has been reached. These better Southland qualities are all absorbed by local cordage-works.

The s.s. "Somerset," which sailed from New Zealand for west coast ports of the United Kingdom on the 25th March, loaded at Lyttelton 4,579 and 401 sacks oats for Avonmouth and Glasgow respectively. This is the first shipment of oats of any importance from the Dominion to the United Kingdom for nearly eighteen months.

The farmer is a manufacturer, and the farm is his factory. This is always in operation. He can either sell his crop products or he can convert them into other forms. Thus, fattening-cattle, milch-cows, pigs, and sheep serve as machines for converting his crops into more profitable products, and these machines, in order to produce the best results, should be of the best quality. They should perform the work assigned to them without waste and at the least expense. It is unprofitable to use any kind but the best, because a bad machine is too wasteful, and requires too much expense and labour for the work it performs. The cows must be capable of supplying a full yield of milk, the pigs of converting into flesh the rations supplied to them, the fattening cattle of putting on the full weight. Upon the efficiency of the machines depends the product, and the quicker the machine works the smaller is the proportion of raw material used up, and proportionately the greater is the profit. Of course, the machines must be kept in good order by careful and judicious treatment, and just as a machine wants fuel so an animal machine requires suitable food.—*Mark Lane Express*.

THE APIARY.

NOTES FOR MAY.

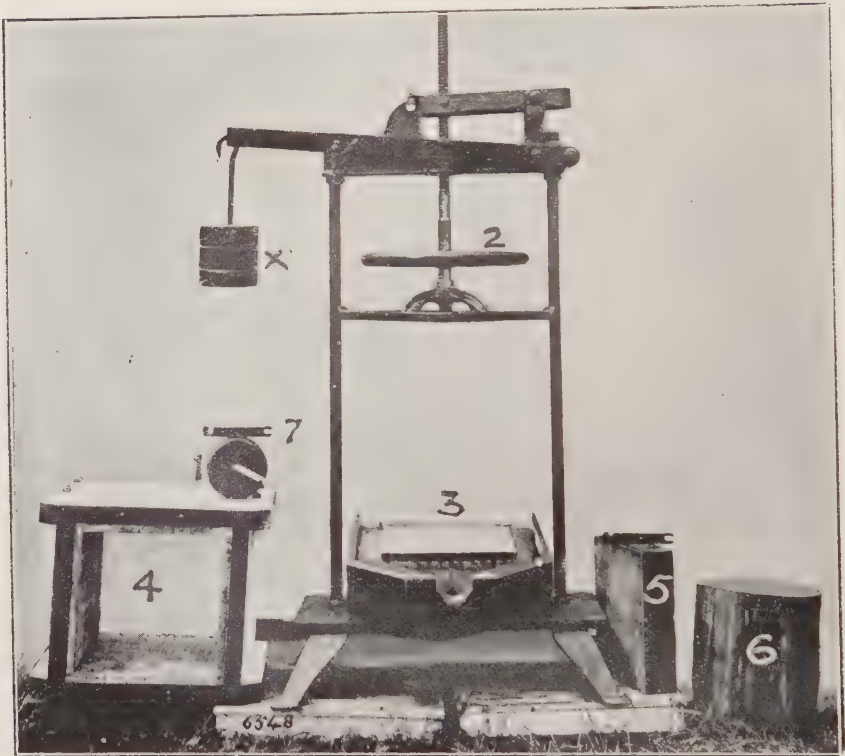
F. A. JACOBSEN.

HONEY CAPPINGS-PRESS.

BEES, like every kind of stock, require continuous attention to produce the best results. A full crop in a large apiary takes a deal of handling, and the question arises how to get through the work effectually with the least trouble. Many new arrangements have been placed before the public recently, some good, others bad; but what I am going to describe below, and term a "honey cappings-press" has been tested and proved to be among the former class. As seen in the illustration, this press is built on similar lines to a wax-press, and has been built from the remains of an old hand cheese-press. Of its efficiency I cannot say enough. It undoubtedly saves a great quantity of honey that would otherwise go into the sun extractor with the cappings, and thereby be spoilt. I have carefully reckoned the saving at about 5 per cent.: for instance, if you had a 20-ton honey crop it would be increased by the use of this press to probably 21 tons. Another notable point in its favour is the saving of both time and room. The sun on frequent occasions is not strong enough to melt the cappings in the sun extractor, and of necessity they accumulate and absorb room that could be better used for other purposes. In describing this press and in subsequent remarks it will be necessary to frequently refer to it, so for convenience I will name it the Jacobsen cappings-press or No. 1, it having been made by C. A. Jacobsen, of Little River, Canterbury, some three seasons ago. The second illustration is a modification of the Jacobsen press, and was made by Mr. W. Lenz, of Masterton, who recognizes, and can testify to, its value. I will call this press the Lenz, or No. 2, and this is the one that will be used largely in the future, on account of old cheese-presses or suitable other equipment being scarce and costly to make. It has an advantage over No. 1 in that it is not heavy and may readily be moved about, and is suitable for shifting to out-apiaries. It does good work, but is perhaps not so efficient as the Jacobsen, on account of much less pressure being brought to bear.

In looking at the illustration of No. 1 press you will notice how everything has been built for strength. This is to prevent breakages

when a large pressure is brought into bearing on the cappings. Every additional weight (see No. 1, fig. 1) adds an extra ton pressure. Mr. Jacobsen has five of these weights, and can therefore supply 5 tons pressure, exclusive of that brought to bear by the wheel marked

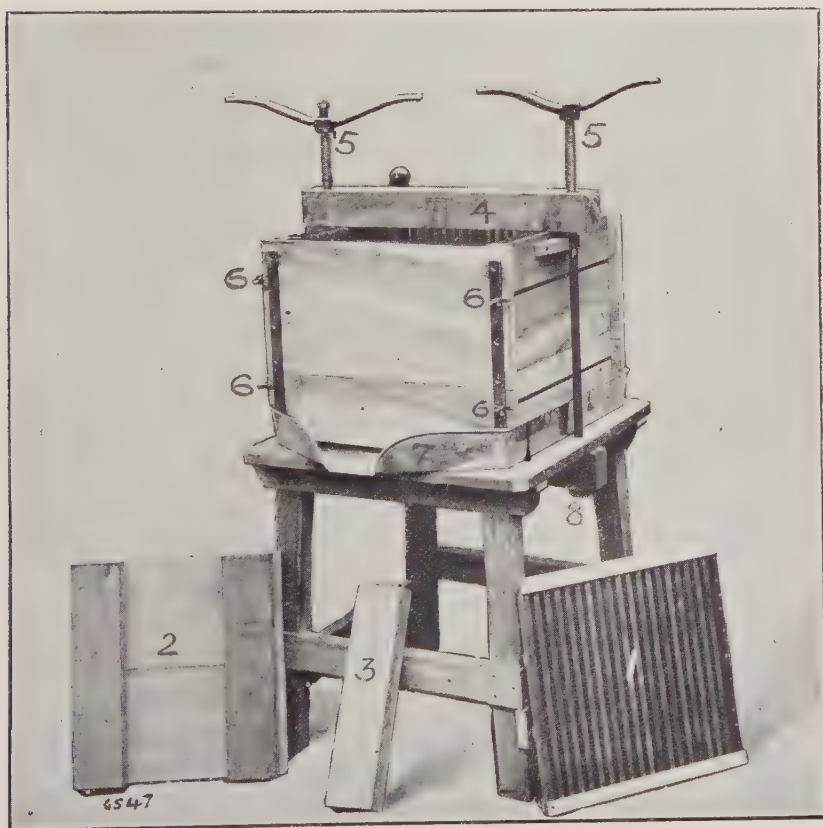


NO. 1.—THE JACOBSEN HONEY-CAPPING PRESS.

Photo by F. A. Jacobsen.

“No. 2.” This pressure may be left on until every particle of honey is squeezed out of the cappings, and they will not become less as they are squeezed down. The weights on the drop sink lower as the shrinkage in the box takes place, thereby keeping up a continuous pressure. The wheel marked “No. 2” may be used independently of the weights. No. 3 comprises the bottom part of the press, and is made of 2 in. kauri. It is 2 ft. 6 in. from back to front, and 18 in. wide. Running all the way round, and nailed on the side, is a strip 3 in. by 1 in., projecting 1 in. above the top surface of the bottom board, to receive the box portion of the press and prevent leakage. Strips 13 in. by $\frac{1}{2}$ in. by $\frac{1}{2}$ in. are nailed in the centre of the bottom. These are kept $\frac{1}{2}$ in. apart, and form a square to fit into the inside of the box, which is placed on the bottom. On the top surface of these strips is tacked

perforated steel, or two or three thicknesses of wire gauze, to allow the honey to squeeze through and so pass along the length of the strips and out through the front. The box marked "No. 4" is also made of 2 in. kauri, and is bolted together with two bolts on each side and extending from one side to the other. It is 16 in. deep and 18 in. wide, outside measurement, with projecting sides 22 in. long, for the purpose of allowing plenty of hold for the bolts. The inside is covered all round with $\frac{1}{2}$ in. by $\frac{1}{2}$ in. strips, tacked $\frac{1}{2}$ in. apart running from top to bottom. On top of these is tacked the same material as the bottom has been covered with. The inside measurements are now 13 in. by 13 in. No. 5 is a stout top, to go



NO. 2.—THE LENZ HONEY-CAPPING PRESS.

Photo by F. A. Jacobsen.]

directly on the cappings, and is fitted with strips the same as the box and bottom. This is made out of 3 in. timber, to stand the strain, although it is perhaps not necessary to have it so thick. No. 6 is a large wooden block placed on the top of No. 5, when it no longer projects

above the sides of the box. The wheel is then screwed down on this block, which takes the pressure, forcing down No. 5 on the cappings and squeezing out the honey. No. 7 is a little fixing for raising the box off the bottom, to enable the operator to push the block of wax right through the box. Two bolts with big heads are screwed into the top of the box on each side, so that when No. 2 is screwed down tightly on No. 4 these bolts are in position, one on each side of the lower portion of No. 2. The two No. 7 fixings are then placed over the base of No. 2 and under the bolt-heads, so that when the wheel is screwed up the box is lifted bodily off the bottom, when the wax may be pushed right through. Each succeeding day when the cappings have been pressed into solid blocks they are placed on one side ready for melting down, and the honey can be run in with the extracted honey, being just as pure in every particular.

PRESS No. 2.

No. 2 is a press much lighter in construction than No. 1, but is better for out-apiary work, being more easily shifted about. It is made of 1 in. timber, and the sides of the box, the bottom and top, are fitted with strips and perforated steel, the same as in No. 1. When the block of wax is to be removed the box is taken apart by loosening the thumb-screws marked in the figure No. 6. The box then comes readily apart. No. 1 is the top, No. 2 goes on top of No. 1, and several pieces marked "No. 3," or as many as required, go on top of No. 2 to make up the packing required as the cappings are squeezed down. No. 4, of course, takes the pressure from the two main screws numbered 5. No. 7 is a tray to catch the honey, and is shaped to a point in front. The whole is fixed on a stand 2 ft. 3 in. high, and, although very simple, it does the work well. I highly recommend this press for both large and small apiaries.

MARKETING.

Honey put up for sale should be in neat and attractive packages, and labelled distinctly. 1 lb. and 2 lb. glass jars are becoming very popular, one man using about eighty gross this year. Some merchants favour 2 lb. tins, but I think the glass jars will eventually run these off the market. Honey put up in bulk should be in 56 lb. or 60 lb. tins, with two tins to a case. For exporting the 56 lb. tins are the better, London buyers preferring this size to the 60 lb. tin.

A bee-keeping association has been organized at Pahiatua with a membership of about forty. The president is Mr. James Proctor and the secretary Mr. A. Bentley.

ORCHARD WORK FOR MAY.

W. A. BOUCHER.

PLANTING NEW OR EXTENDING ESTABLISHED ORCHARDS.

ALTHOUGH it is very desirable that land to be planted in orchard should be prepared and either fallowed or worked during the summer prior to planting, yet circumstances frequently arise which make it impossible for intending planters to comply with these conditions. In such instances preparation of the land should take place as soon as possible. By far the greater part of the land that is being selected for planting in orchard consists of a heavy surface soil with a moisture-retentive clay subsoil, or friable clay surface with clay subsoil. In the preparation of such land the surface soil should be turned over deeply and the subsoil well stirred and broken up with a subsoil-plough, or an ordinary plough from which the mouldboard has been removed. It is important to note that when subsoiling is being effected it is rarely desirable to bring the subsoil to the surface. After this preliminary preparation the land should be left in the rough during the winter, to be cross-ploughed and harrowed in the spring, preparatory to planting.

HEELING IN NURSERY STOCK.

It is no uncommon thing for consignments of trees to be received from the nurseries at a time when it is inopportune to set them out. In such cases it is necessary to protect the roots from the action of sun and wind until soil and climatic conditions are more favourable for planting. This is done by heeling-in, as it is termed—that is, digging or ploughing out a trench in well-worked friable soil, laying the trees in this either singly or in small bundles, and filling in with loose earth, care being taken to shake it in among the roots and to press down firmly with the foot.

THE LEMON ORCHARD.

A portion of the main crop of lemons should now be ready for gathering, especially if the grower has decided to cure and store for the spring and summer markets. In picking for this purpose size rather than ripeness should be the guide. Lemons gathered green with a faint tint of yellow take on, in the process of curing, a richer yellow than fruit that is allowed to colour on the trees. Moreover, the green lemons keep longer and carry better than those that are allowed to ripen on the trees. As a test for size in gathering lemons a ring $2\frac{1}{4}$ in. in diameter made of metal or

stout leather should be carried by the picker as a guide, for it is the lemon that most nearly approaches this diameter when gathered that gives the best market value when cured and packed.

Detailed information on the handling of the lemon has been published in the issue of this *Journal* of January, 1911, also in Bulletin No. 14 (new series), a copy of which can be had free on application to Orchard Instructors.

BROWN-ROT OF THE LEMON (*Pithiacistis citrophora*).

This disease, which at one time caused serious loss to growers in California, first made its appearance in New Zealand in the year 1908. Since that time it has spread to districts widely separated, attacking not only lemons but also some varieties of oranges, inflicting considerable loss, usually before the grower has realized that a disease new to him has made its appearance. The first noticeable symptom of the disease is a brown spot on the skin of the fruit with a livid ring round it, which rapidly increases in size. Infected fruits commence to drop in considerable numbers, which, even if the spot has not been noticed, should prove sufficient warning to growers that something is seriously wrong and that treatment should be adopted without delay. But rather than wait until serious infection has taken place preventive measures are suggested. In order that growers may understand the reason why a somewhat unusual line of treatment is recommended it may be as well to explain that the fungus which causes brown-rot differs from most other parasitic fungi in this respect, that the soil becomes infected with the dormant spores not only on the surface but even to a depth of 2 ft. below. These spores only require the necessary conditions of temperature and moisture to become active. Observation has proved that the low temperature of the late autumn and winter months is most favourable to the germination and spread of the fungus, for it is during this period that it becomes most destructive, the attack gradually diminishing again as warmer weather sets in. As a preventive treatment growers are recommended to apply a soil-dressing of pulverized sulphate of iron at the rate of 1 lb. to 4 lb. per tree according to age and size. This should be scattered beneath and round about the trees and lightly worked into the soil with a view of destroying as far as possible the spores in the soil, and thus preventing their development to attack the fruit. As an additional precaution the trees should be sprayed with the Bordeaux mixture, 4-5-50 formula. Growers should note that, apart from the effect in controlling the brown-rot fungus, the sulphate of iron has a beneficial effect on the health of the trees.

This treatment for the control of a disease that is very destructive (if measures to prevent attack have not been taken) can be recommended with confidence, for growers who have made use of it speak very highly of the results.

THE FARM GARDEN.

W. H. TAYLOR.

IN the ordinary routine work of a vegetable-garden there is little seed-sowing or planting to be done at this time. There are exceptions to every rule, however, so exigencies of special cases may be allowed to prove the rule here. If the winter supply of turnips has not been fully provided for a sowing may be made now, and if the soil is well drained, and the position open to all the sunshine there is at this season, useful roots may be expected, which, though on the small side, will have the advantage of tender texture and mild flavour. Carrots also in similar circumstances may be ventured on. Except in the warmer districts these will not attain any size, yet they will be exceptionally tender, and will carry the supply farther into the spring than the ordinary crop, for they will be a little later in going to seed. These sowings are not of a speculative nature, having formed part of the writer's regular practice for many years, where these vegetables had to be supplied young and tender for purposes for which large roots were not accepted.

Ground that is bare of crops should not be allowed to grow heavy crops of weeds. It is better to get it dug and exposed to the influence of sun and air. A good depth of loose soil is not merely an advantage—it is an absolute necessity to the certain production of crops all the year round. Deep cultivation should embrace something more than breaking up the soil, in fact, this alone is frequently quite useless, for if a clayey subsoil is loosened the soakage of water during the first winter thereafter will silt it down firm again unless something has been done to prevent it. And here it is where the value of the rubbish-heap is seen. Decaying vegetable matter of any sort (except wood) will, if worked in at the bottom of a trench, keep the soil permanently open, and material may be put in that position that it would be worse than folly to dig in near the surface. Couch-roots, sorrel, dock-roots, and every description of garden or farm refuse, will, if put down at least 2 ft., be in a quite safe position and effect a wonderful mechanical influence on the soil, as well as providing food that will in the dry months be readily sought for by the roots of vegetables. Ground that has unavoidably become very weedy, even when such weeds are only of an annual character, should have at least a shallow trenching, so as to bury the weeds and seeds below the first spit. Weeds in the soil are the cause of many losses. They choke young seedlings, harbour slugs, and shut out sunshine. When once a

crop of weeds has seeded it will take many years to get the ground clean, so the best way is to bury the first few inches of soil to a depth that will prevent the tools used in ordinary cultivation bringing the seeds to the surface.

Plans should now be made for next season's work, so that each kind of vegetable may be allotted the place where the soil is most suitable to its requirements; and, incidentally, the soil be treated in accordance with the objective in view. Peas require soil that is rich in humus. To this end stable or farmyard manure is of greatest value. Cow manure is valuable in light soil, but on no account use it on heavy soil, or you will convert it into a sticky mass. Peas should not be grown twice on the same spot without a year at least between. Where the last season's peas and broccoli were grown will be a good place for carrots, parsnips, and beet-root, because, though a soil that is



HOW TO COVER UP THE RUBBISH-HEAP.—A CONGENIAL PLACE FOR VEGETABLE-MARROWS AND PUMPKINS.

mechanically very free in nature is requisite for these crops, yet they should never be sown on freshly manured land, for when that is done the roots are invariably ugly and poor in quality, frequently forking, and almost always having numerous side roots. Soil that was well manured this season, and has grown a strong crop, will be just right for root crops next season, with perhaps a light dressing of artificial manure. In some places it is not possible to get sufficient stable manure or other humus-making material, yet soil will not long remain fertile unless there is sufficient humus. Oats are sometimes sown to be dug or ploughed in green. When this is done the crop should be turned under long enough before sowing seed to allow the oats to rot, otherwise an unkind and springy bed is likely to result. Some failures I have seen in onion-culture were, I think, traceable to this cause. When digging weedy soil in an ordinary way, all weeds of a perishable

nature should be dug in, as they supply humus; but to grow weeds for the purpose, or to leave them to increase in size so as to augment the bulk of the humus, is a practice that cannot be too strongly condemned, as many are sure to seed, and operations become thereby increasingly difficult.

The practice of using up the late crop of rhubarb for jam or wine making is a bad one. The price paid for it is the loss of the spring crop. None should be pulled; it should be left to rot on the plants. The increasing cultivation of winter rhubarb is likely to create a revolution in rhubarb-culture. The summer, or deciduous, varieties will soon have no value except for the early crop, and attention must be directed to increasing the quality of this, otherwise it may go out altogether. Any one intending to plant winter varieties should do so as soon as possible, so as to get them established before midwinter.

THE FLOWER - GARDEN.

IN most places the most favourable time for planting shrubs, &c., is the autumn. The plants then get established before winter, take the winter rest, and break away into strong growth in spring. In most cases this effects a gain of a season as against spring planting. However, there are exceptions to this rule, and they are found where the place is exceptionally cold, or where water hangs about. This latter should be regarded as a thing to be remedied if possible. Where conditions are favourable there are very few things that cannot be transplanted now on for the next two months; in fact, in many places there is no need to cease planting all the winter.

The most popular flower is still the rose, and in country gardens, which these notes are particularly designed for, roses will in most cases do exceptionally well. It may be advisable at the outset to direct attention to one or two popular errors in connection with rose-culture. Firstly, it is a mistake to suppose they require an extraordinary lot of manure. They certainly require rich soil, but not necessarily much manure. The soil may be rich enough without it, and because a bush is not doing well it does not follow it wants manure. Perhaps it has already too much, or probably what it has was wrongly applied. The guiding hand, the knowledge born of experience, may be all that is wanted. It may be taken as an unalterable axiom that roses, as well as any other plant, will not succeed if stable or similar manure is in immediate contact with the roots. More particularly is this the case with those newly planted. In preparing a bed for roses the first consideration is drainage, that is, if this be necessary. If the subsoil is hard and the

worked soil shallow, trenching may be required. If so, the trenching should be at least 2 ft. in depth. Be careful to keep the top soil still on top. The way to work is this: Mark out a strip, throw out the top spit; next throw out all the rest of the soil from the trench into a separate heap. Now mark out an adjoining strip of exactly the same size—30 in. wide is most convenient—throw the top spit on to the heap of top spit taken from the first trench, throw the remainder of trench No. 2 in to trench No. 1. Mark out another strip, throw the top spit in to trench No. 1, thus finishing it. In this way there are three trenches being worked at the same time. The first lot of soil thrown out fills the last trench. To save labour in wheeling the strip to be trenched, if wide enough, should be done half at a time, so that the last empty trench will be close to the heaps of soil taken from the first trench.

Remarks about vegetable matter to keep the soil open, made in the notes on the vegetable-garden, apply here. Wood-ashes, remains of rubbish fires, &c., are good material, as well as stable manure. It is not advisable at this time to put any manure in the top spit. It would interfere with planting, and should not be given till spring time. But, as before remarked, it does not follow that because roses like rich soil therefore all soils must have manure. If the soil is capable of growing good farm or garden crops it will grow roses, and to give in excess of needs is bad. The season before last I was asked to go to see some roses that were dying. When I stood on the bed it felt almost like a spring mattress, a large quantity of fresh manure having been trenched in. It would have been nearly as sensible to plant roses in a haystack.

One is asked many questions on the planting of roses. Some of them cannot be honestly answered. In like manner, how much artificial manure to the acre do you use for your onions, or your tomatoes? Now, a man never bothers with such abstruse calculations as would be necessary in dealing with a small patch, and, if he is unwary in his answer, he will be almost sure to fall in. Similarly, how deep do you plant your roses? I am sure I do not know. Just as deep as they require to be planted. If you come to inches you are almost sure to be caught tripping. Different plants require planting at varying depths. The criterion is how they were planted before. The treatment the bushes require depends on the condition in which they are received. They may have come from a distance and be somewhat withered. If that is the case they should be revived before planting. The best way to do this is to dig out a trench in nice free soil, separate the plants, and lay them in the trench. Cover them entirely, root and branch, with soil and leave them there for four or five days; then take them up and heel them in. The wood will have plumped up beautifully, and they will be fit for planting. If they were planted in

a withered state some might die, and others start in an enfeebled manner.

Before planting all roots should be recut with sharp seccateurs or a knife, and care taken to cut back beyond bruised places, which would otherwise set up decay. No top pruning should be done at this time except to shorten any extra-long branches that might make it difficult to keep the plant upright in the ground. Dig out a hole wide enough to accommodate the outspread roots, and a little high in the centre. This allows the roots to be outspread and the ends to have a downward tendency. Fill up with soil to about two-thirds, then give a gentle shaking with a slight lift upward; now tread the soil down quite firmly, fill up with soil, and leave this loose. Matters concerning pruning will be dealt with later on. Pruning time is from June and July.

Bulbous plants as a whole are the easiest of plants to cultivate. There are exceptions, of course, but these do not matter. All narcissi should be planted at once. They require soil of a free character, in which they can swell easily; otherwise almost any ordinary soil will suit them, especially if in a sunny aspect. The exceptions to this rule are the Magni Coronati with white trumpets. These do best in a semi-shady place, such as under partial shade of overhanging branches of trees, particularly those of a deciduous nature, as, being bare of leaves in winter, these admit of rain falling on the ground beneath them. The double-flowered Poeticus, which is the omega of the race, and one of the most beautiful, is seldom seen in good order, because it is not generally known that it requires a lot of moisture when the flowers are pushing up. Lacking this they wither before opening. Choose a moist place for them. Narcissi require rather deep planting. A safe guide is to make the hole three times as deep as the bulb is high, of whatever size that may be.

Ranunculus are very beautiful bulbs not grown so much as they should be, because not understood. They require fairly rich and free soil. It is safest to cover them with a special compost. Make drills about 2 in. deep, and fill up with a mixture of leaf-mould and sand. Failing leaf-mould, use stable or cow manure at least two years old. Plant at once. Other bulbs to plant now include ixias, tritonias, sparaxis, babianas, snow-flakes, early-flowering gladioli, and scillas. These last are the wood-hyacinths. The pure-white and pale-pink varieties are best. Also plant at once hyacinths and tulips.

Trees should be made to send their roots deep into the soil in order to fortify themselves against drought.—*California Fruit-grower*.

THE POULTRY INDUSTRY.

F. C. BROWN.

THE BREEDING COCKEREL.

AT the present time many breeders have a number of cockerels and are undecided which to keep for the breeding season. To the student of type with a keen appreciation of the importance of constitution a correct selection should be a comparatively simple matter. The first thing to look to is undoubtedly constitution. This is essential for many reasons, the principal of which may be briefly enumerated. Constitution is necessary if the bird's type is to be perpetuated—that is, if he is to have the desired prepotency; if the female progeny are to have the power to lay all the eggs they are capable of producing; and if disease is to be kept at bay. Again, no great strain of laying-birds has been evolved and maintained at a high utility standard without inbreeding, and there is no surer road to deterioration than inbreeding if constitution is not maintained. All our greatest laying strains are largely inbred; and if their vigour is not preserved they must rapidly decline in egg-producing power, as well as running the risk of being swept off by disease, especially tuberculosis, which is becoming too common among our good laying strains. Say a bird of strong constitution has some little breed defect—it is imperative that it should be built on utility lines—this can be corrected in the mating; but if the bird selected is the best on utility and breed points but is weak in constitution all its advantages will be lost by its failure to impress its desirable characters on the offspring. As to indications of constitution there is no better guide than noting which is the most spirited in action—the bird that will show fight even when a human being approaches it. Obviously it is the most virile, and, therefore, the strongest sire. Such birds are always the “boss” of the yard, even when penned only with cockerels. In the beginning of this season a man complained to me that he had to kill a cockerel he had purchased from a plant of the Department because it attacked him when he entered the yard. I could only reply that he had probably killed the most valuable breeding-bird he ever possessed. No doubt such a bird is dangerous where there are young children, but there should be a place for children and a place for birds. If the poultryman has not the good fortune to possess a cockerel showing the above sure indication of constitution he must perforce depend upon other methods of ascertaining breeding-power, and it is not always

necessary that a bird should display what might be termed viciousness for it to have the desired constitution. The main indications of breeding-power are a bold prominent eye—as with all stock the eye is the “looking-glass”—erect vigorous carriage, standing on good flat-boned legs set well apart, and a tightly feathered plumage. Generally the appearance of the bird—a well-balanced frame carried in a proud manner—is a fair indication of constitutional power. These points may be also taken as indicative of a bird which will beget layers. On the other hand, a cockerel may have the indications of sound constitution, such as a striking carriage and spirited appearance, but may not be built on egg-producing lines, principally indicated by development of the abdominal section of the



THE HOUSES AND RUNS ON THE HERETAUNGA POULTRY PLANT, UPPER HUTT, THE STOCK FROM WHICH WON THE RECENT HEN AND DUCK LAYING TESTS AT CHRISTCHURCH.

[Photo by Mr. F. Mumby, Proprietor of the Plant.]

frame and texture. The surest means, of course, to select a cockerel that will advance egg-producing power is to have a bird possessing the above-mentioned characters combined with a pedigree of performance, or knowledge of the annual egg-yield of the mother and, better still, of the grandmother as well. However, it is never wise even if a bird possesses an exceptional pedigree of performance to select it if it does not possess the indications of strong constitution. Laying-quality must go hand in hand with constitution. It is as well, too, to know that the parents of the cockerel were in vigorous health in their breeding season. I have known hens which were credited with laying a record number of eggs in a season, but their stock has been a woeful disappointment. At the tail end of a

great laying season a hen is obviously not in the desired vigour of breeding-power. She should be rested, and given full opportunity to recoup before being placed in the breeding-pen. The male bird should also be in his prime at this time. Thus, in selecting the cockerel for next season, some intimate knowledge of his ancestors is most desirable.

OVERFORCING THE PULLET.

The desire to secure a big yield from the young stock is leading many poultrymen to overforce their pullets. Nitrogenous material is essential to heavy egg-production, especially in the colder months of the year, but there is a limit to which it can be carried. If the bird is allowed to balance its own ration little or no harm will result; but where meat or substitutes, such as bloodmeal and meat-scrap, are mixed with the mash, and the same ration fed to all members of the flock, whether they be four-, five-, or six-months-old pullets, or second-year birds, the proceeding is decidedly risky. The six-months bird can be highly forced with little danger, but it is inviting trouble to provide the four- to five-months bird with a highly nitrogenous mixture. Ovarian troubles are a natural consequence. Many complaints have reached me of such cases, meaning heavy losses in one or two instances, during the past few weeks. The supplying of meat and meat-substitutes requires to be controlled with considerable caution. Birds on good range do not require the same proportion as birds in close confinement, and the demand of the latter for such material varies according to the birds' laying-condition as well as according to its laying-power. It is probable that where lucerne is available, or where good lucerne hay is at hand for cutting up and mixing with the morning mash, the supply of meat, &c., may be considerably curtailed, and this with advantage. I met with a case the other day of ovarian trouble in a flock which had a good range, was given milk to drink, and had a big supply of bloodmeal. It was easy under the circumstances to point to the cause of the trouble. In this case bloodmeal was not required at all. The weakness of an oversupply of meat food is accentuated where the supply of grain, pollard, &c., is not as liberal as it should be, the poultryman incorrectly reasoning that an extra supply of bloodmeal will make up for the poor supply of the grain materials.

CORNS.

This trouble is certainly on the increase. From careful observation I am much inclined to the opinion that there is some other reason for it than the landing of the bird from a high perch on to hard ground, or having only hard stony runs to exercise in. A feasible cause is the rather unnatural perch commonly used—a 2-in. wide batten with the edges slightly smoothed off; or may be toe-marking encourages the affec-

tion. In the former case the bird is unable to get a natural grip of the perch, and undue pressure is exerted on the ball of the foot. A better perch is a round one, with a smooth surface, $2\frac{1}{4}$ in. to $2\frac{1}{2}$ in. in diameter, but without cracks to harbour vermin. A case came under my notice the other day where practically fifty per cent. of a flock were affected with corns, and yet there was good grass in the runs, the perches were low to the ground, and there was soft litter for the birds to land on. The perches, however, were of the orthodox style—3 in. by 2 in. sawn timber. Apparently the style of perch was the only explanation. The common argument in favour of the flat roost is that it prevents a bird developing a crooked breastbone; but early roosting has, in my opinion, much more to do with this trouble. Obviously the round form is the more natural perch, as the bird's foot is formed to grip a round rather than a flat object.

LIVER TROUBLES.

This is the time of year when liver troubles are most pronounced. One- and two-year-old hens are most frequently affected. Errors in diet are the chief cause, especially when birds are in close confinement and have little or no opportunity for exercise. The moulting process has been a heavy drain on the system; and if the birds are to come to the laying season with their vigour unimpaired they must now have ample nourishing food, with a good supply of green material, of which nothing is better than watercress, and with grit and clean water always before them. It is well to give a little variety to the ration for the birds passing through the moult. In passing through the moult a bird apparently craves for a change of diet; and a change induces her to eat better than she otherwise would do, and thereby has the tendency to reduce the moulting period. Maize and oats may be added to the grain ration, and the morning mash should be made as appetizing as possible by mixing it with meat-soup. A supply of meat is just as necessary for the heavy layer now as it is at any other time; in fact, there is nothing better than meat to bring a bird through her moult. Where green food is not obtainable a little sulphate of iron in the water is a fair substitute—a piece about the size of a hazelnut twice a week in about two quarts of water. This is always helpful in the moulting season.

A GRASSING EXPERIMENT.

An experiment designed to discover the best mixture of grasses for brooder-house runs is to be conducted at Milton Poultry Plant. The following mixtures, recommended by Mr. A. H. Cockayne, Biologist of the Department, will be sown in the different runs: (1.) White clover, 1 lb.; perennial rye, 3 lb. (2.) White clover, 1 lb.; alsyke, 1 lb.; rye, 3 lb. (3.) White clover, 1 lb.; crested dogstail, $\frac{1}{2}$ lb.; rye, 3 lb.

(4.) White clover, $1\frac{1}{2}$ lb.; *Poa pratensis*, $\frac{1}{4}$ lb.; ryegrass, 3 lb. (5.) White clover, $\frac{1}{2}$ lb.; alsyke, $\frac{1}{2}$ lb.; *Poa pratensis*, $\frac{1}{4}$ lb.; crested dogtail, $\frac{1}{4}$ lb.; perennial rye, 2 lb. Total amount of seed, 15 lb. This will make a very thick sowing.

POULTRY SHOWS.

The breeding of fancy poultry may be made a leading step to the evolution of practical breeding on industrial lines, and, rightly applied, exhibitions help in creating a desire for better breeds. But when such breeding is regardless of economic qualities ordinary fancy shows are of small value and may be an injury rather than a help.—*Ed. Brown, Secretary of the Poultry Organization Society of England.*

THINGS TO REMEMBER.

You must now depend principally on the pullets for dear eggs.

The poultry-house should be open in front, to provide an abundance of fresh air, that essential factor to health.

Have your fowlhouse large enough to accommodate the birds during bad weather.

Vermin is the forerunner of disease. If often means the loss of constitutional power.

The best way to gain information is to discuss success and failure with others.

The man who has failed in all other lines of life will make his greatest blunder if he takes on poultry as a last resource.

Cockerels intended for the next season's breeding-pens should have free range if possible.

Work up a private trade if possible, and secure the middleman's profit.

The common trouble with poultry-keepers is that they do not cull sufficiently.

Many farmers would increase their profits by doing away entirely with their present stock and keeping half the number of a purebred strain.

To maintain constitution and vigour means something more than hatching robust stock. The birds must be fed well and kept in good health throughout all stages of development.

When selecting birds for breeding purposes aim at an objective. Keep this always in view, remembering all the time that constitution must never be neglected.

The value of White Leghorns as egg-layers has been demonstrated by the egg-laying competitions. That some of the heavy breeds may, however, be developed from the egg viewpoint has been equally well demonstrated, and, taking the gross return for eggs and carcase combined, these have proved their great value, especially to the farmer.

SOUTHERN TURNIP EXPERIMENTS.

MANURIAL AND VARIETY.

RESULTS OF THREE YEARS' TESTS.

A. MACPHERSON.

Co-OPERATIVE field experiments conducted in the South Island, in order to discover if possible the most suitable turnip varieties for the different districts, and the best manurial treatment of local soils for turnip-cultivation, have been in progress for over three years, and the results of the first three years' investigation are now available. The areas selected for the experiments were typical of considerable extents of similar land in the respective districts.

In the manurial-test plots the fertilizers applied were according to a scheme designed by Mr. B. C. Aston, the Chief Agricultural Chemist. The objects aimed at in these tests were to ascertain by practical field experiments for a series of years the fertilizer or combination of fertilizers and quantities best suited to the different types of soil and the varied climatic conditions which obtain in the areas where demonstrations are conducted that will produce the largest crops at a minimum of cost and with least injury to the soil.

In the variety tests the objects aimed at are to ascertain by tests extending over a number of years the relative merits of the different sorts under trial, as to quality, productiveness, earliness in maturing, best keeping, and most resistant to insect pests and fungoid diseases, and to varieties which best suit the different soils and varied climatic conditions. The seeds sown in the variety tests were obtained from reputable seed-merchants in Great Britain and in the Dominion.

The land selected for the test plots on each farm was as nearly uniform in character as could be found, and, before sowing, was in most cases brought into a good condition of tilth.

The weather from time of sowing to near the harvesting of the crop was not conducive to the growth of good root crops. The sowings were done during a very dry period, and in many districts where experiments were conducted little or no rain fell for some months afterwards. Consequently the early growth of the plants was slow, local conditions being also favourable for attack by the turnip flea-beetle or turnip-fly (*Phyllotreta nemorum*); in fact these completely ruined the crops in some of the areas. Subsequently, in other areas, when the leaves were nearly full-grown, such dry and warm weather-conditions proved favourable to aphid-life—turnip aphid (*Aphis rapae*) and the diamond-back moth (*Cerostoma xylostella*). The ravages of these last two mentioned insect pests proved so destructive to the leaves that a large number of the experiments were rendered worthless as a test. Where rain followed the attacks of the aphid and diamond-back moth, and moist weather-conditions supervened for a time, there was a second growth of leaves which injured the roots to some extent, causing hardening of the tissues.

SWEDE.—MANURIAL TESTS.

Experiments were conducted on five farms in different localities, covering twenty-five plots, but owing to a variety of unfavourable circumstances already recorded, the results of those on only two farms were considered of sufficient merit to record. The variety of seed sown on all the plots was Sutton's Magnum Bonum. The plots were a tenth of an acre in size. The results will be found on page 298.

SOIL, CONDITION OF LAND, CULTIVATION, AND REMARKS.

A. Houlston, Kakapuka.—Soil: Light clayey loam, on clay subsoil. Condition of land: In lea to 1908, in rape 1909. Cultivation: On 15th September, 1910, disc-ploughed twice and cultivated; 16th November, grubbed, tine-harrowed, and rolled with clod-crusher; 24th November, thrown into drills with double ridger and seed sown; drills 26 in. apart; plants thinned out to about 8 in. apart; after-cultivation during growth. Harvested 11th July, 1911. Remarks: The crop suffered from drought, and the turnip-aphid did considerable damage to the foliage.

R. Hammond, Te Moana, Geraldine.—Soil : Light clayey loam on stiff clay subsoil. Condition of land : In lea for four years, drained with drain-plough in 1909, and broken up from lea in 1910. Cultivation : On 22nd July, 1910, ploughed from lea : 25th October, disc-harrowed and tine-harrowed three times ; 1st November, cultivated ; 30th November, cultivated, harrowed, thrown into drills with double ridger, and seed sown. Harvested 27th July, 1911. Remarks : The seed struck well. The crop suffered from drought and attack of aphid. Owing to these conditions the few swedes in the unmanured plot did not have the strength to last, and died out. Under the circumstances the crop was a good one, and about the best in the district.

SWEDE.—VARIETY TESTS.

Ten trial tests were initiated on farms in different localities, the total number of plots being 232. Owing to unfavourable weather-conditions and destruction by insect pests already referred to, seven out of the ten trial tests were considered worthless as such, and were not therefore weighed. The results of trial tests of three of the farms will be found on page 299.

SOIL, CONDITION OF LAND, CULTIVATION, AND REMARKS.

A. Houlston, Kakapuaka.—Same particulars apply as already given in manurial tests. Fertilizer used : Surprise Island guano, $2\frac{1}{2}$ cwt. per acre. Crop harvested : 11th July, 1911.

Joseph Smith, Stirling.—Soil : Sandy loam. Conditions of land : 1906 in wheat, 1907 turnips, 1908 wheat, 1909 turnips, 1910 wheat. Cultivation : On 1st September, 1910, ploughed ; 1st November, cultivated twice, tine-harrowed and rolled with clod-crusher ; 29th November, land thrown into drills with ridger and seed sown, drills 26 in. apart. Plants thinned out 8 in. apart. Inter-cultivation. Fertilizers used : Fison's fertilizer, $2\frac{1}{2}$ cwt. per acre. Crop harvested : 10th July, 1911. Remarks : The season was unfavourable, being too dry, consequently the plants came away very slowly. Subsequently the leaves of some of the varieties were badly injured through insect pests, therefore the roots were lacking in both size and quality.

R. Hammond, Te Moana, Geraldine.—Same particulars apply as already given in manurial test. Fertilizer used : Superphosphate, 1 cwt. per acre. Crop harvested : 27th July, 1911.

REPORT ON VARIETIES.

From notes made 28th April, 1911, on growing crop of swedes on the farm of Mr. Joseph Smith, Stirling, Otago, which from inspection of similar tests on other farms may be taken as fairly indicating the merits or demerits of the different varieties during the past season as regards insect pests and root-growth.

Hurst and Sons' Perfection : Leaves injured by aphid and moth ; roots fair. Hurst and Sons' X.L. All : Leaves badly injured by aphid and moth ; roots fair. Hurst and Sons' Best of All : Leaves injured by aphid and moth ; roots good. Hurst and Sons' Imperial East Lothian : Leaves badly injured by aphid and moth ; roots poor. Hurst and Sons' Select Monarch : Leaves badly injured by aphid and moth ; roots poor. Hurst and Sons' Kangaroo : Leaves injured by aphid and moth ; roots fair. Hurst and Sons' Lord Derby : Leaves not injured by aphid or moth ; roots very good.

Webb and Sons' New Empire : Leaves almost perfect, no aphid or moth ; roots good. Webb and Sons' Imperial : Leaves perfect ; roots excellent. Webb and Sons' Giant King : Leaves slightly injured by aphid and moth ; roots good. Webb and Sons' New Buffalo : Leaves perfect ; roots excellent.

Sutton's Champion Purple-top : Leaves injured by aphid and moths ; roots very good. Sutton's Crimson King : Leaves injured by aphid and moth ; roots fair. Sutton's Lord Derby : Leaves fine and apparently delicate, but only slightly injured by aphid and moth ; roots very good. Sutton's Up-to-date : Leaves badly injured by aphid and moths ; roots fair. Sutton's Elephant : Leaves not injured ; roots good.

Nimmo and Blair's Standard : Leaves injured by aphid and moth ; roots fair. Nimmo and Blair's John Bull : Leaves injured by aphid and moth ; roots small but fairly good.

Montgomery and Co.'s Skirving's Purple-top : Leaves badly injured by aphid and moth ; roots medium.

Garton's Superlative : Leaves very badly injured by aphid and moth, being the worst affected of the twenty-six varieties on trial ; roots medium. Garton's Model : Leaves very small, but only very slightly injured by aphid and moth ; roots fair. Garton's Cropwell : Leaves not injured ; roots small in size but of good quality. Garton's Pioneer : Leaves badly injured by aphid and moth ; roots fair. Garton's Perfection : Leaves badly injured by aphid and moth ; roots fair. Garton's Green Tankard : Leaves badly injured by aphid and moth ; roots fair.

YELLOW-FLESHED TURNIPS.—MANURIAL TESTS.

Manurial tests were initiated on eight farms in different localities, the total number of plots being forty-seven. The same unfavourable conditions prevailing in regard to the swede experiments also apply to those carried out in connection with the yellow- and white-fleshed turnips, in consequence of which the experiments on two farms were considered not to be of sufficient merit to warrant the crops being harvested. The variety of seed sown in all manurial tests was Fosterton Hybrid. The results obtained from experiments on five farms will be found on page 300.

YELLOW-FLESHED AND WHITE-FLESHED.—VARIETY TESTS.

Experiments with varieties were initiated on twelve farms in different districts, there being a total of 337 plots. Owing, however, to unfavourable conditions previously mentioned, the results from six farms only come to be recorded. Of the six farms where crops failed, five were in Canterbury and one in Otago. The results will be found on pages 301 and 302.

SOIL, CONDITIONS OF LAND, CULTIVATION, AND REMARKS.

H. Snushall, Clydevale.—Soil: Sandy loam on clay subsoil. Condition of land: In fescue grass for twelve years. Cultivation: 15th July, 1910, broken up 8 in. deep for present experiment; 4th August, two strokes of disc harrows; 15th December, two strokes of disc harrows; 17th December, two strokes of tine harrows; 19th December, rolled and seed sown on the flat in drills 14 in. apart. Crop harvested, 28th June, 1911. Remarks: The weather was very dry from the middle of January to the end of February. The fescue sod was very tough to break up, therefore difficult to get the land into a fair tilth.

J. and W. Smith, Waitakuna West.—Soil: Clayey loam on clay subsoil. Condition of land: Twenty years in cocksfoot-grass. Cultivation: Broken up in June, 1910, for present experiment; 1st September, disc-harrowed; 4th November, tine-harrowed and disc-harrowed twice; 18th December, two strokes of tine harrows, and rolled; 20th December, thrown into raised drills with ridger and seed sown, drills 26 in. apart. After cultivation given, and plants thinned out to about 8 in. apart. Remarks: Turnip braided well, but was badly checked from middle of January to end of February with dry weather; made good progress from March onwards. In manurial test No. 1 plot did better and kept fresher during the dry period than the others.

J. Hyslop, Greenfield.—Soil: Light and shingley, rotten rock subsoil. Condition of land: Seven years in grass prior to 1909, when broken up and put in oats; 1910, present crop. Cultivation: 20th April, 1910, oat-stubble ploughed; 15th November, tine-harrowed and ploughed; 1st December, tine-harrowed three times and grubbed twice; 22nd December, drilled with ridger and seed sown, drills 26 in. between. After-cultivation given and plants thinned out to about 8 in. apart. Fertilizer applied to variety tests: 2 cwt. per acre, "Perfection" fertilizer. Crop harvested: 23rd May, 1911. Remarks: Season was too dry; plants made little progress until March and April. Plot 4 in manurial test was very blanky. Turnips in variety test were not so blanky as in the manurial test.

C. F. Overton, Clydevale.—Soil: Clay loam on clay subsoil. Condition of land: Twelve years in lea, then in turnips and grass; a crop of hay taken off first year, then in lea for three years and a half. Cultivation: 30th June, 1910, ploughed 6 in. deep; 12th December, two strokes of disc harrows; 18th December, four strokes of tine harrows; 20th December, seed sown with drill on the flat in rows 14 in. apart. Fertilizer applied to variety tests: 2 cwt. per acre "Challenge" manure. Crop harvested: 27th June, 1911. Remarks: The weather was very dry from early in January to the beginning of March. Crop did very well considering the dry season.

S. Andrews, Kaikoura.—Soil: Loamy soil of swamp formation, well drained. Condition of land: Twelve years in grass prior to 1909, when broken up and sown with wheat. Cultivation: June, 1910, wheat stubble ploughed for present experiment; November, cultivated, tine-harrowed three times, and rolled; 26th December, tine-harrowed, seed sown with drill on the flat in rows 14 in. apart. Crop harvested: 16th June, 1911. Remarks: The poor results are attributable to the ravages of the turnip-fly and the weedy nature of the ground on which the turnips were grown.

R. Houlston, Kakapuaka.—Soil: Clay loam. Condition of land: Four years in lea to 1908, when broken up and put in wheat in 1909. Cultivation: 1st May, 1910, stubble ploughed with digger-plough; 30th September, disced twice, and rolled with clod-crusher; 1st December, grubbed twice and rolled with clod-crusher; 6th December, thrown into raised drills with double-ridger and seed sown, drills 26 in. apart. After-cultivation given and plants thinned out to about 8 in. apart. Fertilizer applied to variety tests: 2½ cwt. per acre, Surprise Island guano. Remarks: Season was very dry, with little moisture in the ground, consequently roots did not grow to any size, but the quality was good. The crop was free from aphid and moth.

SWEDE.—MANURIAL TESTS.

Manures used per Acre.

Name and Address of Experimenter.	Plot 1.		Plot 2.		Plot 3.		Plot 4.		Plot 5.	
	Superphosphate, 2 cwt. Seed Gypsum, $\frac{1}{2}$ cwt. Value, 10s. 9d.	Yield of Crop per Acre, in Tons.	Superphosphate, 1 cwt. Bonedust, $\frac{1}{2}$ cwt. Kainit, $\frac{1}{2}$ cwt. Seed Gypsum, $\frac{1}{2}$ cwt. Value, 13s. 9d.	Yield of Crop per Acre, in Tons.	No Manure.	Yield of Crop per Acre, in Tons.	Superphosphate, Bonedust, Sulphate of Potash, Seed Gypsum, Value, 13s. 6d.	Yield of Crop per Acre, in Tons.	Superphosphate, 1 cwt. Bonedust, $\frac{1}{2}$ cwt. Seed Gypsum, $\frac{1}{2}$ cwt. Value, 11s. 3d.	Yield of Crop per Acre, in Tons.
	Roots. | Tops.		Roots. | Tops.		Roots. | Tops.		Roots. | Tops.		Roots. | Tops.	
Adam Houliston, Kakapuaka ..	16.86 | 1.63		20.39 | 1.63		14.14 | 0.81		24.72 | 1.90		22.30 | 1.90	
Robert Hammond, Te Moana, Geraldine ..	40.66 | 2.35		38.93 | 3.38		Nil | Nil		32.70 | 2.84		35.60 2.35	

SWEDEN. VARIETY TESTS.

Yield per Acre, in Tons.

Name and Address of Experiment.	Hurst & Son's Perfection.		Hurst & Son's In- perial East Lothian.		Hurst & Son's Best of All.		Hurst & Son's In- perial East Lothian.		Hurst & Son's Select Monarch.		Hurst & Son's Lord Derby.		Webb & Son's New Empire.		Webb & Son's Imperial.		Webb & Son's Giant King.		Webb & Son's New Buffalo.		Sutton's Champion Crimson King.	
	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.
Adam Houlston, Kakapuaka ..	23-39	1-63 21-13	1-08 15-50	0-81 22-03	1-63 17-13	1-36 21-49	1-08 16-05	1-63 17-95	0-81 19-58	1-90 17-68	1-36 18-22	1-90 22-85	1-90 18-77	1-90								
Joseph Smith, Sterling ..	27-77	1-36 30-20	0-54 35-37	1-63 20-40	1-08 20-67	0-81 25-30	1-63 35-91	2-18 28-29	1-08 41-08	2-72 30-47	1-90 45-43	2-72 36-18	1-63 25-30	1-36								
Robert Hammond, Geraldine ..	32-70	2-06 35-25	1-74 35-35	1-74 36-24	1-76 33-58	1-76 35-35	1-76 37-12	2-65 39-77	1-76 32-70	2-65 31-82	1-76 35-35	2-65 36-24	2-65 42-42	2-94								

Yield per Acre, in Tons.

Name and Address of Experiment.	Sutton's Lord Derby.		Sutton's Up- to-Date.		Sutton's Magnum Bonum.		Sutton's Elephant.		Nimmo & Blair's Standard.		Nimmo & Blair's John Bull.		Montgomery & Co's. Skirving's Purple Top.		Garton's Model.		Garton's Cropwell.		Garton's Pioneer.		Garton's Perfection.		Garton's Green Tankard.	
	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.
Adam Houlston, Kakapuaka ..	17-68	1-36 19-58	0-81 18-22	1-90 21-13	1-63 17-95	1-08 18-77	0-54 18-77	2-44 18-77	1-90 25-30	0-27 26-11	0-54 15-50	0-81 15-50	1-63 13-87	1-36 21-49	1-36 11-15	0-81								
Joseph Smith, Sterling ..	38-63	1-36 27-77	0-81 29-38	1-08 34-82	2-18 29-38	1-63 29-93	1-36 23-67	1-08 25-30	0-27 26-11	0-54 38-90	1-08 24-93	1-08 24-21	0-81 26-39	1-36										
Robert Hammond, Geraldine ..	37-12	2-65 31-73	2-07 27-40	1-76 31-73	1-76 32-70	2-94 32-70	3-53 19-44	2-65 29-16	1-76 35-58	1-76 28-28	2-94 29-16	2-65 30-05	2-94 36-24	2-94										

YELLOW-FLESHED TURNIPS.—VARIETY TESTS.

Yield per Acre, in Tons.

Name and Address of Experimenter.	Sutton's Purple-top Aberdeen.		Sutton's Perfection Green-top Aberdeen.		Sutton's Mikado Purple-top Hybrid.		Sutton's (Century).		Sutton's Early Sheep Fold.		Sutton's All-the-Year Round.		Sutton's Romney Marsh.		Garton's Old Meldrum.		Montgomery's Invincible Green-top.		Garton's Green-top Scotch.		Garton's Purple-top Scotch.	
	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.
J. and W. Smith, Waikahuna West	14-96	2-17	14-55	1-90	..	..	23-26	3-26	19-58	2-31	16-59	2-24	18-77	5-03	..	..	15-23	3-26	15-37	4-35	..	..
R. Houlston, Kakapuaka	23-49	1-67	22-08	1-67	..	..	21-76	1-36	21-90	1-36	24-75	2-48	26-38	1-49	..	..	22-30	2-31	16-32	3-31	..	..
J. Hyslop, Waterside, Greenfield	10-60	4-62	9-38	3-80	..	..	11-74	4-48	15-23	3-53	15-23	5-12	8-70	4-21	..	..	10-33	4-62	7-34	4-89	..	..
H. Snushall, Clydevale	20-21	2-52	18-19	2-52	..	..	23-79	3-03	17-68	1-01	19-20	2-02	19-70	2-02	..	..	18-19	2-02	18-69	1-51	..	..
C. F. Overton, Clydevale	26-27	2-52	22-23	1-51	..	..	25-75	1-51	27-77	2-77	21-28	1-52	20-21	1-57	..	..	19-70	3-03	18-63	2-52	..	..
Average yield per acre 1910-1911	18-99	2-70	17-46	2-28	..	..	21-26	2-81	19-83	2-19	19-41	2-67	18-75	2-86	..	..	17-15	3-04	15-27	3-31	..	..
1909-1910	16-89	2-22	20-76	2-76	15-53	2-02	23-70	2-59	24-70	2-21	25-29	3-55	25-28	2-26	19-14	2-88	17-31	2-10	22-08	3-18	17-16	2-22
1908-1909	24-03	4-09	20-96	3-36	23-56	3-16	29-86	2-79	29-69	2-44	30-45	3-43	28-95	2-87	20-86	3-31	24-86	3-62	..	..	..	..

Name and Address of Experimenter.	Garton's Inches Bronze-top.		Garton's Michaelmas Purple-top.		Garton's Stobo Blue.		Garton's Waites Eclipse.		Garton's Dates Hybrid.		Montgomery's Green-top Yellow Aberdeen.		Montgomery's Purple-top Yellow Aberdeen.		Montgomery's Frostton Hybrid.		Montgomery's Yellow Tankard.		Nimmo and Blair's Challenge Golden Yellow.	
	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.
J. and W. Smith, Waikahuna West	12-65	2-72	16-47	3-80	16-58	3-53	18-09	3-12	18-36	3-80	15-64	4-62	15-50	3-67	18-27	3-80	16-18	3-94	14-14	3-80
R. Houlston, Kakapuaka	16-18	1-94	20-67	2-48	15-27	2-17	24-07	1-94	16-45	2-49	19-17	1-67	16-17	1-76	20-67	2-31	20-94	2-48	14-91	1-76
J. Hyslop, Waterside, Greenfield	9-25	4-08	7-88	5-44	8-16	5-12	13-05	5-44	10-06	5-44	7-07	4-62	7-07	5-44	6-25	4-89	11-69	6-80	6-25	5-12
H. Snushall, Clydevale	18-69	1-51	13-64	1-51	17-68	1-51	13-13	1-51	17-68	1-51	11-46	2-02	13-13	2-02	19-20	2-02	16-17	2-02	14-15	2-02
C. F. Overton, Clydevale	17-68	2-52	24-76	3-03	27-28	2-52	22-74	1-01	21-20	2-02	22-74	2-52	21-22	1-51	19-20	2-52	21-22	2-52	20-71	2-02
Average yield per acre 1910-1911	14-89	2-55	16-68	3-25	16-99	2-97	18-21	2-63	16-04	3-05	15-85	3-09	14-61	2-88	16-71	3-10	17-24	3-55	14-08	2-94
1909-1910	18-19	2-81	18-64	2-85	19-93	2-74	16-80	2-52	21-15	3-28	20-76	2-76	23-06	2-97	23-35	4-27	21-66	3-52	..	..
1908-1909	20-14	2-71	21-78	3-90	..	..	23-58	3-74	25-49	3-23	20-96	3-36	25-28	2-98	24-81	3-86	..	..	..	..

WHITE-FLESHED TURNIPS.—VARIETY TESTS.

Name and Address of Experimenter.	Yield per Acre, in Tons.																			
	Sutton's Imperial Green-top.		Sutton's Purple-top Mammoth.		Sutton's Pomeranian White.		Sutton's Early Six Weeks.		Sutton's Red Paragon.		Garton's Hardy Green Globe.		Wright Stephenson's Early Marvel.		Montgomery's Lincolnshire Red Globe.		Montgomery's Devonshire Greystone.		Montgomery's White Stone or Stubble.	
	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.	Roots.	Tops.
J. and W. Smith, Waitahuna West	23.39	2.58	28.29	4.35	22.58	3.40	19.31	2.58	20.93	2.85	22.85	3.80	14.69	2.17	23.39	3.80	19.31	4.21	18.63	2.31
R. Houlston, Kakapuaka	31.56	1.94	29.65	3.40	26.93	2.48	21.22	1.94	23.53	1.76	32.92	2.72	19.72	1.49	25.30	3.53	24.76	2.72	25.03	2.48
J. Hyslop, Waterside, Green- field	17.27	3.94	16.73	4.89	16.32	6.80	13.87	2.44	14.01	4.35	14.69	5.44	12.78	2.44	12.78	6.93	11.15	6.80	11.52	4.35
H. Snushall, Clydevale	23.24	2.02	17.18	2.02	16.17	2.52	17.18	2.02	19.70	2.02	21.72	2.52	18.19	1.01	18.19	3.03	16.17	3.03	21.22	2.52
C. F. Overton, Clydevale	20.19	1.51	30.32	5.05	17.18	2.48	20.72	2.48	22.23	2.48	16.17	2.73	17.18	2.48	17.18	4.04	21.73	4.53	15.16	2.48
Average yield per acre, 1910-11	23.13	2.39	24.43	3.94	19.83	3.53	18.46	2.29	20.08	2.69	21.69	3.44	16.51	1.91	16.51	4.26	18.72	4.25	18.31	2.82
" " 1909-10	25.54	2.42	26.67	3.55	"	"	19.72	2.41	23.79	4.80	29.76	4.25	9.36	"	21.66	4.06	24.19	3.92	23.72	3.77
" " 1908-09	31.29	2.23	33.89	5.12	35.96	5.08	29.58	2.56	32.30	5.31	34.51	3.50	25.80	1.30	29.75	4.57	36.27	4.15	24.44	2.39

SOUTH ISLAND FORAGE CROP TESTS.

A. MACPHERSON.

THE following is a report giving weights and particulars regarding the capacity of some forage crops grown on an experimental area at the Canterbury Frozen Meat Company's property at Belfast, and eaten off by sheep, or otherwise dealt with.

RAPE.

Essex Broadleaf.—Sown 9th October, 1911, in drills 21 in. apart. Manured with Belfast rape fertilizer at the rate of 3 cwt. per acre. Stocked 12th January, 1912. Weight of leaves per acre, 12th January, 1912, 29.55 tons.

Giant Essex Broadleaf.—Sown 9th October, 1911, in drills 21 in. apart. Manured with Belfast rape fertilizer at the rate of 3 cwt. per acre. Stocked 12th January, 1912. Weight of leaves per acre, 12th January, 1912, 38.54 tons.

Remarks.—The varieties were not eaten off separately, but were included inside a ring fence and a mob of 115 sheep and strong lambs put on to eat both plots at the one time. The carrying-capacity of the crops was at the rate of 223 sheep per acre for fourteen days. Since the sheep were taken off both varieties have come away well, and will be sufficiently grown in a short time to be stocked again.

KALE.

Thousand-headed.—Sown 7th October, 1911, in drills 21 in. apart. Manured with Belfast rape fertilizer at the rate of 3 cwt. per acre. Stocked 1st February, 1912. Weight of leaves per acre, 1st February, 1912, 23.24 tons.

Green Buda.—Sown 7th October, 1911, in drills 21 in. apart. Manured with Belfast rape fertilizer at the rate of 3 cwt. per acre. Stocked 1st February, 1912. Weight of leaves per acre, 1st February, 1912, 26.96 tons.

Remarks.—These two varieties were fenced off in the same way as the rape, and both plots were eaten off at the same time, the same mob of sheep and strong lambs being used. The carrying-capacity of the crops was at the rate of 217 sheep per acre for fourteen days. Immediately the sheep were taken off the Buda kale grew again at a very rapid rate, the Thousand-headed kale making a very slow recovery and no great growth in comparison with the Buda kale.

CHOU MOELLIER OR MARROW CABBAGE.

Sown 7th October, 1911, in drills 36 in. apart, and plants 2 ft. between in the rows. Manured with Belfast rape fertilizer at the rate of 3 cwt. per acre. First stripping of leaves, weighed 29th February, gave a yield of 30.14 tons per acre.

Remarks.—Part of the plot will be experimented with in the direction of ascertaining for dairying purposes the number of strippings of leaves and weight of leaves per stripping that can be got in a season before finally pulling up the stocks (which also are eatable) and feeding to cattle. Another portion of the plot will be fenced, and sheep put on to it. The weight of the whole plant will be ascertained on date of stocking, as both stem and leaves will be eaten.

SILVER-BEET.

Sown 9th October, 1911, in drills 21 in. apart. Manured with Belfast rape fertilizer at the rate of 3 cwt. per acre. First stripping of leaves, weighed 29th February, gave a yield of 51.72 tons per acre. It was stacked on the 12th of March.

Remarks.—The carrying-capacity of the crop was at the rate of 243 sheep per acre for fourteen days. Mr. Hopkins, manager of the Belfast Freezing Works, reports: "It is the best forage crop of all. The sheep ate it greedily and evidently improved upon it, which was very apparent. The sheep did not run all over it, but went straight ahead eating to the ground as they went. Since the stock were removed I have given inter-cultivation between the rows, and the plants have now 6 in. of growth."

POTATO MANURIAL AND SPRAYING TESTS.

ON THE FARM OF MR. P. WATSON, HALSWELL.

A. MACPHERSON.

THE land selected for the experiment was a clayey loam on a clay subsoil above shingle, typical of similar flat land covering an extensive area in the district. In 1908 it was sown with mangels and manured at the rate of $1\frac{1}{2}$ cwt. per acre with special mangel manure. In 1909 it was sown with peas; no fertilizers were applied. On the 3rd October, 1910, the land was ploughed and afterwards disc and tine harrowed. On the 31st October it was cross-ploughed and tine-harrowed three times.

The area chosen was divided into four manurial and one unmanured plot of one-fortieth of an acre each. The fertilizers used were according to a formula designed by the Chief Agricultural Chemist to the Department. The variety of potato used for the test was Up-to-date. The sets were planted on the flat in rows, 36 in. apart, and 12 in. between each set in the row. The manures were applied and the potatoes planted on the 28th October, 1910.

The spraying tests were carried out under the direction of the Orchard Instructor for Canterbury. One-half of each plot was sprayed with Bordeaux mixture on the 19th December, 1910, and the 9th and 30th January, 1911, the mixture being 2 lb. sulphate of copper, 2 lb. washing-soda, to 20 gallons water.

Intercultivation was given during the early growth of the plants, and in December the crop was earthed up twice. The season was an extremely dry one from the time of planting to the date of harvesting.

The crop was free from fungoid disease, and the potato-moth (*Gelechia operculella*), although present in the field, did little damage, the crop having been well earthed up. The width between the rows admitting of this being done in a satisfactory manner, so that none of the tubers were exposed on the surface to be easily attacked by the moth. Owing, however, to the very dry season, a small percentage of the tubers were soft and flabby. A sample of these was forwarded to Mr. A. H. Cockayne, Government Biologist, who reported as follows: "Several samples of similar soft potatoes have been received of late, but in all cases they have been from districts that have suffered from the recent drought. An examination shows no sign of any insect or fungoid attack, but the cells are quite abnormal, being notably deficient in starch. I am sure the cause has been the absence of sufficient soil moisture at that period when the potatoes were at their highest rate of growth."

The potatoes were dug, classified, and weighed on the 12th April, 1911. The soft flabby potatoes, described above, were classified as unsound. The results will be found on the next page.

EXPERIMENTS ON THE FARM OF MR. W. DAVIS, AMBERLEY.

The land selected for the experiments was a light loam on a clay subsoil, and typical of similar flat land covering an extensive area in the district. It had been in grass for twelve years, was broken up on the 4th August, 1910, tine-harrowed several times on the 5th, cross-ploughed on the 17th, tine-harrowed on the 20th, and disc-harrowed, ploughed, tine-harrowed and rolled on the 31st August, 1910.

The area chosen was divided into seven manurial plots of one-fortieth of an acre each, and one unmanured plot of one-eighth of an acre. The fertilizers used were according to a scheme designed by Mr. B. C. Aston, Chief Agricultural Chemist. Up-to-date was the variety of seed used. The sets were planted whole, 12 in. apart, in raised drills 32 in. wide. The manures were applied and the potatoes planted on the 13th October, 1910.

POTATO MANURIAL AND SPRAYING TESTS.

Plot No.	Manures applied per Acre.	Cost of Manure per Acre.	Classification of Tubers.	Manurial Test.		Spraying Test.			
				Yield per Acre.	Gain by use of Fertilizers per Acre.	Unsprayed Yield per Acre.	Sprayed Yield per Acre.	Gain per Acre over Unsprayed Area.	Gain per Acre of Marketable Sound Potatoes in Sprayed Area.
		£ s. d.		Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1	2 cwt. superphosphate	1 0 3	Marketable size, sound	13.92	..	13.92	14.05	..	0.13
	1½ cwt. bonedust		Small unmarketable size, sound	4.41	..	4.41	5.30	..	
	1½ cwt. bonedust		unsound	0.68	..	0.68	..	..
				19.01	4.49	19.01	19.35	0.34	
2	2 cwt. superphosphate	1 10 9	Marketable size, sound	11.58	..	11.58	11.79	..	0.21
	1½ cwt. bonedust		Small unmarketable size, sound	4.61	..	4.61	5.09	..	
	1½ cwt. dried blood		unsound	0.38	..	0.38	..	..
				16.57	2.05	16.57	16.88	0.31	
3	2 cwt. superphosphate	2 10 9	Marketable size, sound	10.25	..	10.25	14.00	..	3.75
	1½ cwt. bonedust		Small unmarketable size, sound	4.51	..	4.51	8.40	..	
	1½ cwt. dried blood		unsound	1.17	..	1.17	..	..
	1 cwt. sulphate of potash			15.93	1.41	15.93	22.40	6.47	
4	No manure	..	Marketable size, sound	10.21	..	10.21	13.25	..	3.04
			Small unmarketable size, sound	3.83	..	3.83	5.79	..	
			unsound	0.48	..	0.48	..	..
				14.52		14.52	19.04	4.52	
5	2 cwt. superphosphate	2 10 9	Marketable size, sound	11.39	..	11.39	13.35	..	1.96
	1½ cwt. bonedust		Small unmarketable size, sound	4.51	..	4.51	4.71	..	
	1 cwt. sulphate of potash		unsound	0.48	..	0.48	..	..
	¼ cwt. sulphate of ammonia			16.38	1.86	16.38	18.06	1.68	

The spraying tests were carried out under direction of Mr. Courtier, Orchard Instructor for Canterbury. One-half of each plot was sprayed four times at intervals of about fourteen days with Bordeaux mixture, 2 lb. sulphate of copper, 2 lb. washing-soda, to 20 gallons of water.

The drills were harrowed down on the 27th October, and inter-cultivation given up to the 23rd November. On the 7th December the potatoes were moulded up, and on the 7th January, 1911, were further moulded up to as high a point as possible, to ensure that the tubers would be covered, and so secure them as much as possible from injury by insect pests or fungoid diseases.

The season was an extremely dry one from time of planting to date of harvesting; consequently was not favourable for manurial tests, the yield per acre of some of the plots showing this in a very marked degree, the returns from three plots being less than that obtained from the unmanured or control plot.

The crop was free from disease, but the potato-moth (*Gelechia operculella*) was in evidence in the potato-field. It did very little damage, however, in the experimental area, as the earthing-up of the crop had been satisfactorily done; consequently only a few of the tubers were exposed in the drills. It was noticeable at time of harvesting the crop that no damage was done by the moth to potatoes exposed in the drills in the sprayed area.

The potatoes were dug, classified, and weighed on the 5th and 6th April, 1911. The results will be found on the next page.

If any farmers carrying out co-operative experiments with lucerne find dodder in their crops the Biologist of the Department, Mr. A. H. Cockayne, would be glad to receive specimens of affected plants. It has been reported that dodder has been seen in French seed offered for sale in the Dominion, but so far dodder has not been reported on in any of the lucerne crops of New Zealand.

The Government of Peru and the Peruvian Corporation have agreed jointly to employ the professional services of Dr. H. O. Forbes, former director of the Liverpool Museum, and one of the world's most competent naturalists and ornithologists, to make an exhaustive study for the protection of the birds which produce guano in order to ensure the continuity of the supply through future years. The demand for guano on the part of planters in Peru is increasing every year.—“*Peru To-day*.”

The farm women of Belgium have entered upon an era of organization. About five years ago “circles of farm women” began to appear in that country. These had increased to seventy-four circles in 1910, with an aggregate membership of about ten thousand. All matters pertaining to the betterment of women's condition in Belgium are taken up in these circles, and at yearly reunions well-known experts lecture on domestic economy, dairying, gardening, hygiene of children, and so on. Now a national committee of women has been formed and a monthly publication issued.—*Spokesman Review*.

POTATO MANURIAL AND SPRAYING TESTS.

Plot No.	Manures applied per Acre.	Cost of Manure per Acre.	Classification of Tubers.	Manurial Test.		Spraying Test.			
				Yield per Acre.	Gain or Loss per Acre by Use of Fertilizers.	Unsprayed Yield per Acre.	Sprayed Yield per Acre.	Gain per Acre over Unsprayed Area.	Gain per Acre of Marketable Size Sound Potatoes in Sprayed Area.
		£ s. d.		Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1	2 cwt. superphosphate 1½ cwt. bonedust	1 0 3	Marketable size Small unmarketable size	2-26 11-44	Gain 0-60	2-26 11-44	3-53 12-95	1-51	0-24
2	2 cwt. superphosphate 1½ cwt. bonedust 1½ cwt. dried blood	1 10 9	Marketable size Small unmarketable size	8-90 2-66	Gain 0-72	8-90 2-66	11-87 4-21	2-97	
3	2 cwt. superphosphate 1½ cwt. bonedust 1½ cwt. dried blood 1 cwt. potash sulphate	2 5 9	Marketable size Small unmarketable size	8-72 3-02	Gain 0-90	8-72 3-02	10-96 4-65	2-24	
4	No manure	..	Marketable size Small unmarketable size	8-04 2-80	..	8-04 2-80	10-08 3-18	2-04	
5	2 cwt. superphosphate 1½ cwt. bonedust 1 cwt. potash sulphate ½ cwt. ammonia sulphate	2 5 9	Marketable size Small unmarketable size	7-10 3-66	..	7-10 3-66	9-13 4-41	2-03	
6	2 cwt. superphosphate 1½ cwt. bonedust 1½ cwt. dried blood 1 cwt. potash sulphate 1 cwt. ferro. sulphate	2 13 9	Marketable size Small unmarketable size	8-27 3-75	Loss 0-08	8-27 3-75	11-96 4-00	3-69	
7	2 cwt. superphosphate 1½ cwt. bonedust 1½ cwt. dried blood 1 cwt. potash muriate	2 6 3	Marketable size Small unmarketable size	6-64 2-98	Gain 1-18	6-64 2-98	8-78 3-88	2-14	
8	4 cwt. superphosphate	1 1 0	Marketable size Small unmarketable size	5-65 3-07	Loss 1-22	5-65 3-07	6-92 4-95	1-27	
				8-72	Loss 1-12	8-72	11-87	8-15	

REVEGETATING EXPERIMENTS.

TESTS IN CONNECTION WITH DEPLETED COUNTRY, CENTRAL OTAGO.

A. MACPHERSON.

ON the 12th February last an inspection was made of the experiments being conducted in connection with the regrassing of depleted country on the Earnsclough Run, Central Otago, the following being particulars noted regarding the respective grasses and forage-plants sown at different periods—viz., 2nd November, 1910, April, 1911, and 23rd October, 1911.

GRASSES, ETC., SOWN 2ND NOVEMBER, 1910.

The land had been well grubbed and harrowed before sowing, and raked and rolled after sowing. Plots 66 ft. long by 3 ft. wide.

Plot.	Variety.	Remarks.
1	Cocksfoot	Doing very well.
2	Smooth-stalked meadow-grass ..	Only a few plants.
3	Chewing's fescue	A few plants over all the plot have seeded.
4	Hard fescue	A few plants.
5	Sheep's fescue	"
6	Red fescue	Has done better than other fescues; has seeded.
7	North Island oat-grass	Failure.
8	Prairie-grass	Good all over, covering the plot well; has seeded well; has been cut down twice.
9	Birdsfoot trefoil (minor)	Good number of plants all over plot; now 5 in. high.
10	Fiorin	A good many plants, but not doing well.
11	White clover	A good fair strike all over plot, and has seeded.
12	Crested dogstail	Fairly thick all over plot, but not doing well.
13	Chicory	Doing well.
14	Yarrow	Doing well; cut back twice; very fresh.
15	Awnless brome-grass	Strong and healthy; good number of plants all over plot; has seeded.
16	Sheep's burnet	Plants strong and healthy; doing very well; has been cut back three times.
17	Bokhara clover	Doing well; cut once; has seeded; plants average 2 ft., some 39 in. high.
18	Kidney-vetch	Good over plot; has been cut back and seeded; plants strong and healthy.
19	American red-top grass	Plants all over plot, but growth poor; no feeding-value.
20	Tall oat-grass	Doubtful.
21	Sweet vernal	A few plants.
22	Sheep's parsley	"
23	Various-leaved fescue	A few plants; no growth.
24	Lucerne	Good all over plot; has been cut twice, and growth now 8 in. to 13 in.
25	Rhodes grass	Dead.
26	Blue-grass (native)	A few plants over plot; strong and healthy; seeding.

GRASSES, ETC., SOWN 2ND NOVEMBER, 1910—continued.

Plot.	Variety.	Remarks.
<i>Special Grasses from the Agricultural College, New Mexico (sown in Drills).</i>		
1	<i>Chaetochloa caudata</i> (Setaria) ..	A good few plants, and has seeded.
2	<i>Boutiloua curtipendula</i> ..	A good number of plants doing well; growth 4 in.; has seeded.
3	<i>Panicum plenum</i> ..	A few plants in row strong and healthy, and has seeded; some plants have died out.
4	<i>Panicum bulbosum</i> ..	Doubtful.
5	<i>Boutiloua oligostachya</i> ..	"
6	<i>Sporobolus Wrightii</i> ..	"
7	<i>Sporobolus flexuosus</i> ..	"
8	<i>Leptochloa dubia</i> ..	"
<i>Grasses planted in Drills.</i>		
..	<i>Festuca dumetorum</i> ..	Good number of plants regular in row; doing well, and has seeded.
..	<i>Phalaris canariensis</i> ..	Good number of plants, and has seeded.
..	<i>Phalaris bulbosa</i> ..	A few plants.

Mixture of Grasses sown in Plots.

- Plot 1. Surface-sown and harrowed in, the following grasses, &c., being most prominent: Cocksfoot, prairie-grass, chicory, yarrow, sheep's burnet, white clover, Bokhara clover, and lucerne.
- Plot 2. Land cultivated and well harrowed before sowing. This plot is good all over, the following grasses, &c., being prominent: Cocksfoot, chicory, yarrow, sheep's burnet, Bokhara clover, lucerne.
- Plot 3. Land cultivated and harrowed before sowing. Sown with five varieties of fescue. Doing fairly well, but very little feed.

GRASSES AND FORAGE PLANTS SOWN APRIL, 1911.

The land had been well grubbed and harrowed before sowing, and raked and rolled after sowing. Plots 66 ft. long by 3 ft. wide.

Plot.	Variety.	Remarks.
1	Cocksfoot ..	A few plants, but not as good as previous sowing.
2	Smooth-stalked meadow-grass ..	Doubtful.
3	Chewing's fescue ..	Doing well, but no feed.
4	Hard fescue ..	" "
5	Sheep's fescue ..	Not so good.
6	Red fescue ..	"
7	Oat-grass (North Island) ..	Evidently dead.
8	Prairie-grass ..	One of the best grasses; thick all over plot; cut twice; seeding freely.
9	Fiorin ..	Few plants, no feed.
10	Crested dogtail ..	Good few plants, but no feed.
11	Awnless brome-grass ..	Good all over; plot greenest of all at present; thick, strong and succulent.
12	Red-top grass ..	Growing very well; good number of plants.
13	Tall oat-grass ..	Good all over plot; seeded; strong and vigorous.
14	Various-leaved fescues ..	Dead.
15	Rhodes grass ..	"
16	Birdsfoot trefoil (minor) ..	In patches very good.

GRASSES AND FORAGE-PLANTS SOWN APRIL, 1911—*continued*.

Plot.	Variety.			Remarks.
17	White clover	..	..	Has come away all over plot thickly, but at the time of inspection was quite brown owing to exposure to winds and heat.
18	Bokhara clover	..	..	Good all over plot; has been cut and seeded; plants 27 in. high.
19	Chicory	..	..	Growing all over plot very thick; plants small but healthy.
20	Yarrow	..	..	Good all over plot, and healthy.
21	Sheep's burnet	..	..	Splendid; completely covers plot; cut twice and seeded.
22	Sainfoin	..	..	Almost as good as burnet; cut twice; good plants, and green.
23	Kidney-vetch	..	..	Equal to last, but suffered from heat last few days; thick all over plot.
24	Sheep's parsley	..	..	Fair all over plot, but not made much growth.
25	Lucerne	..	..	Splendid growth all over; has been cut once; thick all over plot.
26	Rib-grass	..	..	Good all over plot; healthy plants.
27	Blue-grass (native)	..	..	A few plants.

Mixture of Grasses.

Land received same working as previous plots. Plots 66 ft. by 12 ft.

Plot 1. Grasses, &c., have done well, those most prominent being awnless brome-grass, cocksfoot, prairie-grass, sheep's burnet, sainfoin, yarrow, kidney-vetch, Bokhara clover, chicory.

Plot 2. Fairly good all over, most prominent being sheep's burnet, yarrow, cocksfoot, sainfoin, chicory, Bokhara clover.

Plot 3. Sown with five varieties of fescues. Fairly thick all over plot, but little growth or feed.

GRASSES AND FORAGE-PLANTS SOWN AND PLANTED 23RD OCTOBER, 1911.

The land had been grubbed and harrowed before sowing and raked and rolled after sowing. The seed was sown in plots 66 ft. by 3 ft. Taking into consideration the unfavourable weather-conditions since date of sowing, it is too soon yet to state with any degree of certainty regarding individual plots, and therefore in the remarks column when "doubtful" is used it means that there is nothing striking about the growth at date of inspection.

Plot.	Variety.			Remarks.
1	Cocksfoot	..	..	Very few plants.
2	Smooth-stalked meadow-grass	..	..	Doubtful.
3	Chewing's fescue	..	..	"
4	Sheep's fescue	..	..	"
5	Red fescue	..	..	Few plants.
6	<i>Danthonia pilosa</i> (North Island oat-grass)			Doubtful.
7	<i>Danthonia semi-annularis</i> (South Island oat-grass)			"
8	Prairie-grass	..	..	A good few plants all over.
9	Fiorin	..	..	Doubtful.
10	American red-top grass	..	..	"
11	Crested dogtail	..	..	"
12	Awnless brome-grass	..	..	Few plants healthy and strong.
13	Tall oat-grass	..	..	As good as prairie-grass; a good number of plants all over; strong and healthy.

GRASSES AND FORAGE-PLANTS SOWN AND PLANTED 23RD OCTOBER, 1911—*continued*.

Plot.	Variety.	Remarks.
14	Rhodes grass	Doubtful.
15	Birdsfoot trefoil (minor) ..	Very good all over; plants small.
16	" (major) ..	Doubtful.
17	Boyd's clover	Doing very well; good few plants.
18	White clover	Doing fairly well.
19	Chicory	A few plants strong and healthy.
20	Yarrow	Coming away all over plot.
21	Sheep's burnet	Doing well; some very fine plants.
22	Sainfoin	Good few plants; now in flower.
23	Kidney-vetch	Good number of plants growing well.
24	Sheep's parsley	A few plants showing.
25	Lucerne	Good all over; now 8 in. high.
26	Rat-tail	Doubtful.
27	Lupin	Good few plants, flowering; growth about 9 in.
28	Bokhara clover	Good all over; growth about 9 in. high.
30	<i>Agropyron scabrum</i> (native blue-grass)	Too early to report.
31	<i>Agropyron pectinatum</i> (Australian spiked blue-grass)	"
32	<i>Triodia nuda</i>	"
33	<i>Poa Colensoi</i> (blue-tussock) ..	"

Mixture of Grasses, &c.

Land received same working as previous plots. Sown in plots 66 ft. by 12 ft.

Plot 1. Most prominent to date are—Lucerne, cocksfoot, chicory, and sheep's burnet.

Plot 2. Most prominent to date are—Chicory, Bokhara clover, sheep's burnet, prairie-grass, sainfoin. Good plot all over. Bokhara clover doing particularly well.

Plot 3. Varieties sown—Fiorin, Rhodes grass, and four varieties of fescues. So far, very few plants showing.

Plot 4. Varieties sown—Lucerne, white clover, fescue, tussock, and two varieties of agropyron. Too soon to report.

Lucerne.—Half-acre—quarter-acre of which was sown with lime well incorporated with the soil before sowing. A good number of plants over the area; growth about 6 in.

Grass and Forage-plants.

Planted closely in rows 12 in. apart.

Plot.	Variety.	Remarks.
1	<i>Agropyron repens</i>	Doing well all over; seeded; seed-stalks 12 in. in length.
2	<i>Festuca arenaria</i>	Also doing well, and seeded.
3	<i>Phalaris bulbosa</i>	Patchy.
4	<i>Helianthi</i>	Doing very well; foliage 16 in. high; strong and healthy.
5	Chilian fescue.. ..	Growing slowly.

Mr. Clement Stephenson, a British veterinary surgeon and a breeder of Aberdeen Angus cattle, has given £5,000 towards the proposed building of a new Agricultural Department in connection with the Armstrong College, Newcastle, for advisory work among farmers.

EXPERIMENTAL CEREALS.

SUPPLIES OF NEW VARIETIES.

G. DE S. BAYLIS.

With a view to extending the areas of some of these varieties, lately introduced at considerable trouble and cost by the Department, and also in order to give farmers in other districts a chance of becoming acquainted with these varieties, a list of a few of the original experimenters is hereby attached, who may be willing to sell a few bushels to farmers desiring to obtain seed.

Farmers will greatly assist in this work if the original experimenters with these varieties will keep a careful record of names and addresses of those to whom they sell seed of the new varieties, and forward these particulars to the Director of Fields and Experimental Farms *at the close of the sowing season*. Purchasers are requested to keep a record as to how these varieties suit their soils and climatic conditions, and, through the medium of the post, to allow the Department to have the benefit of their observations. A great deal of useful information to the individual and general benefit may be collected through the medium of such helpful co-operation.

AUSTRALIAN WHEATS.

Federation.—Imported by the Department in 1908. Fourth year harvested in the Dominion. A crossbred, produced by Farrer, of Purple Straw and Farrer's Fife Indian wheats. Ripens early, resists drought and wind, prolific, retains its grain, mills well: Thomas Masters, Ohakea; R. Warriner, Greatford; C. A. Masters, Feilding; R. Glasgow, Bonny Glen; A. Stuart, Heaton Park Estate, Bull's; H. J. Bradley, Raupo, North Auckland; W. Chapman, Fordell; Marton Experimental Plots, Marton.

Comeback.—Imported from Australia in 1908.—Fourth year harvested in the Dominion. Strong flour. R. Warriner, Greatford; Thomas Gifford, Rongotea; Stephen Bros., Awahuri; Job Harris, Sanson; Marton Experimental Plots, Marton.

Yandilla King.—Imported from Australia by the Department in 1908. D. Crabb, Marton; Marton Experimental Plots, Marton.

John Brown.—Imported from Australia in 1910. Second year harvested in the Dominion. Crossbred, originated by Farrer. Strong flour; rust-resisting; good yielder. Imported into Canada has given better results than the favourite Canadian varieties. Marton Experimental Plots, Marton.

Power's Fife.—Imported in 1910 from Australia. Strong flour of good quality. Thomas Gifford, Rongotea; J. H. Perrett, Sanson.

Jonathan.—Strong flour of good quality. John Perrett, Sanson.

SWEDISH WHEATS (IMPORTED IN 1910).

Swedish Pearl.—Imported from Svalof, Sweden. Thomas, Gifford, Rongotea; Marton Experimental Plots, Marton.

Grenadier.—Imported from Svalof, Sweden. A winter variety. Marton Experimental Plots, Marton.

ANGLO-FRENCH WHEATS (IMPORTED IN 1910).

White Marvel.—H. J. Bradley, Raupo, North Auckland.

SWEDISH BARLEYS (IMPORTED IN 1910 FROM SVALOF).

Hennchen Barley.—J. H. Perrett, Sanson; Marton Experimental Plots, Marton.

Swan-neck Barley.—Marton Experimental Plots, Marton.

ENGLISH OAT.

Triumph.—Introduced from England in 1910. Noted for the strength of straw; abundant leafage; valuable in conjunction with vetches or peas as mixed forage.

Mixed with tares at Marton Experiment the plots yielded $15\frac{3}{4}$ tons per acre of green feed this season. W. T. London, Kimbolton; Marton Experimental Plots, Marton.

SWEDISH OATS.

Victory.—Imported from Svalof, Sweden, 1910. Second year harvested in the Dominion. Strong straw; abundant leaf; white oat of good quality. Also grown this season as a mixed forage crop, and yielded 16 tons of green fodder. W. T. London, Kimbolton; W. Miller, Masterton.

Beardless Propsteier.—Imported from Svalof, Sweden, 1910. Second season harvested in Dominion. Strong in the straw, abundant leafage. Grown as mixed forage crop yielded $17\frac{1}{2}$ tons per acre of green fodder. W. Miller, Masterton; E. Harper, Matahiwi, Masterton.

White Ligowo.—W. T. London, Kimbolton; W. Cameron, Te Ore Ore, Masterton; E. Harper, Matahiwi, Masterton.

CANADIAN WHEATS (IMPORTED IN 1911 FROM CANADA).

Turkey Red.—Winter variety. Noted for making strong flour for baking purposes. R. Warriner, Greatford; Marton Experimental Plots, Marton.

Imperial Amber.—A winter variety. Noted for making the strongest flour. Marton Experimental Plots, Marton.

White Fife.—Similar to Red Fife. W. J. Birch, Marton; Marton Experimental Plots, Marton.

Red Fife.—Best variety for making very light bread. A Canadian spring variety. H. J. Fowler, Cliff Road, Marton; Marton Experimental Plots, Marton.

NEW VARIETIES OF GRAIN.

WHERE PROBABLE SUPPLIES MAY BE PURCHASED.

THE new varieties of wheat, oats, and barley introduced by the Department have now been grown on a more or less considerable scale under the co-operative experimental system. It is the desire of the Department that these be further tested on a commercial scale in different districts. With this object in view, a list of some of the growers who have co-operated with the Department is published above, while there are several growers of new varieties in the South Island. From the farmers in question the necessary supplies of seed may probably be purchased, that is, if supplies be available. It is particularly desired that growers who may purchase seed to test the introduced varieties referred to on an ordinary-crop basis should communicate their experiences.

INTRODUCED VARIETIES OF WHEATS.

TESTED AT MARTON EXPERIMENTAL PLOTS.

G. DE S. BAYLIS.

BELOW are tabulated the yields from the various plots of wheat grown this season at Marton experimental plots. As has before been stated, the Marton experimental plots have, up to the present, been chiefly used for making a rough trial of some varieties of grains lately introduced from other countries into New Zealand by the Department with a view to obtaining some idea of their characteristics and the likelihood of their being of service in this country, and lastly, but all-important, in order to secure a stock of partially acclimatized seed of these varieties for further experiments upon a somewhat more extended scale in other districts during the coming season. It is hoped they will then be definitely tested for yield against the standard crop grown in the district.

Cultivation: The cultivation given to all the wheat-plots this season was practically identical, and consisted in skim-ploughing about middle of March, and harrowing at the end of the month. About the end of May the land was cross-ploughed, somewhat below the depth of last year's ploughing. It was subsequently given two strokes of the harrow shortly before seeding, and one stroke after drilling.

Manures.—The manure mixture used in each case was mixture $\frac{C2}{M}$, and it was composed of 34 lb. Gear blood, 34 lb. Wanganui bonemeal, 17 lb. superphosphate, 5 lb. potash-sulphate, 10 lb. seed gypsum; total, 100 lb. The amounts used were as near 175 lb. per acre as the drill, borrowed for the purpose, would sow them. The cost of the application was 11s. 8d. per 175 lb.

Seeding: With regard to the seeding, the most suitable quantity to sow per acre for each different variety was a rather difficult matter to arrive at, seeing several of the varieties had not been grown in this country previously. The nature of the wheat, however, was taken into consideration, and, whenever a variety had been previously grown, experience gained in such trials was utilized. With the exception of Swedish Pearl, of which only an indifferent sample from a late harvesting last year was obtainable, and of which, consequently, a far heavier seeding was given than would have been otherwise necessary, and Comeback, of which at least 3 bushels should have been sown had the drill in use not refused to do its work, the quantities used from the appearance of the growing crops seemed satisfactory. In this connection it will be noted that with the Australian varieties nearly 3 bushels of seed has been sown per acre. It was noticed in previous trials made with these wheats upon the Marton Junction soil that a far heavier seeding could be given of these varieties than the amount usually sown per acre of the ordinary kinds grown in New Zealand, and the position taken up by Federation in the tabulated yields seems to justify this assertion.

Legumes as a preparatory crop: Another point worth noticing is the fact that the three varieties which come first as regards yields are grown on plots which carried a leguminous crop during the previous season.

Strength of the Marton Junction soils: It perhaps says something in favour of the character of the Marton Junction soil when it is noted that plots 1 and 9, holding respectively fourth and fifth places, with respective yields of $49\frac{3}{4}$ bushels and $47\frac{1}{2}$ bushels, had both produced wheat in the previous season, plot 1 yielding 39 bushels of wheat last season, and plot 9 30 bushels.

Lime: All the Marton plots have now been limed. The northern half received 5 cwt. per acre of ground limestone in the autumn of 1910, and the southern half received the same amount per acre in the autumn of 1911. The effect of the lime in sweetening, giving more life to the soil, and rendering it more friable and easier to work, is very

noticeable, especially upon the northern half, which has been limed the longer of the two portions.

Maturity: On looking over the dates on which plots were sown and harvested, some points of interest are noted. Grenadier and Turkey Red, both true winter varieties; Red Fife and White Fife, both either spring or autumn wheats; Imperial Amber and Swedish Pearl, both winter varieties, were all sown the third week in July, and harvested during the second week in February, taking approximately 211 days from seeding to harvest.

Federation, which may be used either as a spring or autumn wheat, was sown in the first week in June, some forty-four days previous to the varieties above mentioned, and was ready to harvest twenty-seven days earlier than these varieties. It thus occupied the land for 228 days, or for seventeen days longer than did Grenadier, Imperial Amber, &c. Red Tuscan, sown about same date as Federation, was harvested some fourteen days later than Federation. From this data we may conclude that every variety of wheat has a definite amount of growth to make, which occupies a definite number of normal "growing-days" (according to the variety grown) before the plant has reached its utmost development and passes into the ripening or maturing state. From the number of days during which Federation occupied the ground, when sown early in June, it is evident that during the winter months there must be a considerable number of days upon which the plant makes no growth whatever, and which, although taken cognisance of by the farmer, cannot be counted into the number of normal "growing-days" occupied by the plant in reaching the ripening stage of its life's history.

From the same facts I am inclined to think that, in a normal season in the Marton district, and probably in the Wairarapa also, many of the varieties usually sown should in reality take a far longer period to reach the stage at which the grain should start to ripen than our normal climatic conditions allow them between the date of a somewhat late spring sowing and the commencement of the dry weather of late summer or early autumn. When a diminution in the moisture contained in the soil forces all such plants to mature, their seeds, whether the plants are completely developed or only sufficiently developed to render it possible for them to be seed-bearing. I am convinced that this state of things happens far more frequently in the North Island than is generally supposed; and that, to a considerable extent, it is the cause of the "light crops," "shrivelled grains," and "poor-quality samples" of which so much is heard among North Island growers. To a great extent the remedy lies, when spring-sowing, in the selection of a variety which will not require a greater number of "growing-days" in a normal season than there usually are in that district between sowing and reaching the stage at which the grain is well filled and starts to ripen.

In some districts and in some cold soils the above consideration, if taken into account, would practically put most of our ordinary wheats out of consideration altogether, and confine the soil for spring sowing to such varieties which occupy only a short period after seeding and before they reach the stage at which they are ready to ripen. If, on soils of this description, the farmer wishes to grow wheats which take a longer period to mature, believing, as some do, that usually the plant which under normal conditions takes a longer period to develop will yield the heavier crop, then he must select suitable winter varieties and sow them accordingly. Provided that the soil is well cultivated, and the crop well done by—seeing that by thus sowing a variety suitable to his soil and climate every possible chance will be afforded it to develop fully before it starts to bear seed—the chances are that the grower will secure a considerable advantage, not only in yield but in quality. To summarize:—

Every variety of wheat possesses a character of its own.

Each variety of wheat, grown under normal conditions, will require a certain number of "growing-days" after seeding before it has fully developed, and filled its grains, and is therefore ready for ripening them.

The number of "growing-days" required varies according to the variety.

If in a normal season in your district a wheat is sown which naturally requires more "growing-days" than you usually get after sowing and until full development is reached, then a light yield of pinched grains of poor quality results.

It is possible that many of the varieties of wheats which are now spring sown in the North Island require a longer period for development than climatic conditions permit. Remedy: Sow earlier, if climatic conditions permit, or grow a shorter-lived variety, or select a winter wheat suitable to your country, and sow accordingly. In wet, cold, clay soils, drain and thereby make the soil warmer, and enable the crop to be sown

earlier. Lime will also render the soil sweeter, more friable, and warmer, and will thereby permit of earlier sowing.

THE VARIETIES.

Plot.	Variety.	Origin.	Yield per Acre.	Date harvested.	Seed sown.	Date sown.	Manures per Acre. C2 M	Previous Crop.
21	Grenadier.	Svalof Seed-breeding Institution, Sweden	53 bush. 45 lb.	Feb. 13	lb. 154	July 17	176 lb. Cost, 11/8	Peas.
23	Federation	N.S.W.	52 bush. 5 lb.	Jan. 17	170	June 3	180 lb. Cost, 12/	Peas.
25	Turkey Red	Canada	51 bush. 47 lb.	Feb. 7	125	July 20	175 lb. Cost, 11/8	Tick-beans.
1	Red Fife	Canada	49 bush. 47 lb.	Feb. 13	140	July 18	175 lb. Cost, 11/8	Wheat.
9	White Fife	Canada	47 bush. 31 lb.	Feb. 13	130	July 31	175 lb. Cost, 11/8	Wheat.
27	Yandilla King	N.S.W.	46 bush. 4 lb.	Jan. 16	180	June 1	185 lb. Cost, 12/4	Maize and peas.
19	Imperial Amber	Canada	44 bush. 14 lb.	Feb. 7	180	July 17	175 lb. Cost, 11/8	Oats and peas.
Tri- angle	Swedish Pearl	Svalof Seed-breeding Institution, Sweden	44 bush.	Feb. 13	180	July 19	200 lb. Cost, 13/4	None.
29	Red Tuscan	N.Z.	43 bush. 41 lb.	Jan. 29	165	June 1	180 lb. Cost, 12	Maize.
17	John Brown	N.S.W.	43 bush. 6 lb.	Jan. 16	165	June 3	176 lb. Cost, 11/8	Oats.
15	Comeback	N.S.W.	29 bush. 20 lb.	Jan. 19	170	July 17	170 lb. Cost, 11/4	Oats.

NOTE.—The high winds prevailing throughout the season, and the exposed position of the country, doubtless took a certain toll upon the yield. All the crops stood well, especially Federation.

NOTES ON THE VARIETIES.

Yandilla King: Imported from Cowra Experimental Farm, New South Wales. Fourth season harvested in Dominion, but only second season harvested at Marton plots. Crops well; easy to mill; stands well. Last season yielded at Marton plots 39½ bushels per acre.

Federation: Imported from Cowra, New South Wales. Fourth season harvested in Dominion, but only second harvested at Marton plots. Ripens early; can be sown either in spring or autumn; fairly drought-resisting; stands up well, and retains its grain; a most useful variety on strong land or exposed places; easy to mill; brown chaff. Last season yielded at Marton plots 28½ bushels per acre.

Comeback: Imported from Cowra, New South Wales. Fourth season harvested in Dominion, but only second season at Marton plots. Spring-sown, matures ten to fifteen days earlier than the ordinary varieties locally grown; this season, being autumn-sown, forty-four days later than Federation, it was harvested only two days later. Local growers say that this wheat may be sown in spring when it is too late to put in any other variety, and a good crop may still be secured. Not less than 3 to 3½ bushels should be sown per acre. (See note on seeding *re* this variety).

John Brown: Imported from New South Wales. Second season harvested in Dominion. Said to be rust-resistant. In Canada has given better results than some of the favourite Canadian varieties. Straw on some soils show a slight tendency to weakness. Easy to mill; brown chaff. Yielded last season at Marton plots 34½ bushels per acre.

Red Fife: Imported from Canada, 1911. Said to be the best variety for making very light bread. Spring variety, also suitable for autumn sowing.

White Fife: Very similar to Red Fife.

Imperial Amber: Imported from Canada, 1911. A winter variety; stools well; said to be a strong flour wheat; an amber-bearded variety; no birds attacked this variety on account of its strong beards.

Turkey Red : Imported from Canada, 1911. A winter variety ; stools well ; said to produce a variety of flour much favoured by bakers. Has done well at Marton, considering it is the first year sown in the country.

Grenadier : Imported from the famous seed-breeding establishment at Svalof in Sweden. A squarely well-built head, rather soft and open chaff ; should be cut a little on the green side, or birds may be troublesome ; purely a winter variety ; stools well.

Swedish Pearl : Imported from Svalof in Sweden with Grenadier. Has a well-built head ; rather soft chaff, and should, like Grenadier, be cut rather on the green side. The yield this season is disappointing, but only a very indifferent sample (badly harvested, consisting of 4 bushels) was available for sowing last season. Is purely a winter variety.

Red Tuscan : New Zealand variety ; well known in New Zealand. Yield last season on Marton plots 40 bushels per acre.

NOTE.—To enable farmers who may be desirous of giving some of these varieties a trial upon a somewhat more extended scale than the co-operative acre permits of, the crops harvested at Marton plots have been retained for seed purposes, and those desirous of doing so will be allowed to purchase the number of bushels they require, if available on application to the Fields and Experimental Farms, Department of Agriculture, Wellington.

CO-OPERATIVE EXPERIMENTERS.

THE following farmers co-operating with the Department on the conduct of experiments have to be added to the list of North Island experimenters published in last month's *Journal* :—

MANAWATU AND RANGITIKEI.

Outram, F. H., Palmerston North, sweet-corn (2).
Harre, J., Kelvin Grove, grass varieties (2).
Dallison, W., Pohangina, grass varieties (16).
Marshall, J. W., Porewa, top-dressing (6).

HAWKE'S BAY.

Buckman, S. C., Piripiri, maize varieties (2).
Elliot, G., Hastings, small top-dressing plots (5).
Miller, A., Hastings, small top-dressing plots (4).
Wellwood, A., Hastings, small top-dressing plots (4).

AUCKLAND.

Bradley, H. G., Raupo, wheat (2).
Turpin, R., Waiotapu, grass mixture.
Salter, N., Waihi, mixed forage.

APPRECIATION.

WRITING under date of the 12th of last month, Mr. F. Milner, Rector of the Waitaki Boys' High School, Oamaru, says : " Please send me regularly twenty-five additional copies of each issue of the *Journal*. The members of the agricultural class have asked me to procure the copies for them, as they intend to have each year's copies bound for future reference." Mr. Milner has since forwarded eleven more annual subscriptions.

Educate the farmer's boy toward a more valuable life on the farm. Uplift the farm home through the education of the farmer's daughter toward greater usefulness and attractiveness in the farm home.—*Secretary James Wilson, of the United States Department of Agriculture.*

FROZEN MEAT TRADE.

THE FRENCH POSITION.

IN reporting on the finding of the Customs Commissioners, deputed by the French Government to investigate the question of cheapening the cost of living, the High Commissioner for New Zealand, under date of 16th January last, sends a summary of the very interesting report in question. Briefly, the finding of the Commissioners is to the effect that while no encouragement whatever should be given to the importation of frozen meat from outside countries, a trade in frozen meat with French colonies should be developed and facilitated in every way, while the farmers of France are also to be assisted in their enterprise. The restrictive sanitary regulations which demand that the carcasses must be imported entirely with the viscera adhering are to remain in force.

Dealing with the dearth of meat in France the Commissioners point out that meat has also risen in value in other countries. Since the year 1903 the rise in value in France has been at the rate of 12 per cent. for beef, veal, and mutton; and, further, that the index-numbers of forty-five of the chief classes of goods sold in the London markets have during the same period risen to precisely the same extent. In common with many economists, the Commission considers that the diminution in the purchasing-power of gold is one of the causes of the rise. Among other reasons attributed to the increasing dearth of meat the principal are considered to be the progressive increase in the consumption of butcher's meat and the increasing cost of agricultural production. As to the former, French statistics show that whereas in 1862 the quantity of meat consumed per head of population was but 25.9 kilos (1 kilo = 2½ oz.) in 1909 it was 57.01 kilos. Further, the increase in meat production in the past seven years has been over 20 per cent. Again, butchers have now a great deal of difficulty in getting rid of their second-quality meat. The traditional stews and hashes are being gradually replaced by legs of mutton, roast joints, and beef-steaks, which are more rapidly prepared—a tendency, by the way, which has been repeatedly emphasized by butchers in New Zealand.

As to the cost of agricultural production, the depopulation of rural districts has been a contributing factor; the salaries of labourers has tended to rise; and manures have greatly risen in value during the last ten years; while such items as harness, cartwright's and farrier's work all tend to increase in cost year by year. In fact, every branch of the agriculturist's work is becoming more expensive. The peasant also, the Commissioners point out, is going in more and more for insurance against accident while at work, death of stock, loss of crops, &c., all of which factors act upon the cost of production.

As to the scarcity and dearth of meat in France last year, which occasioned the crisis reported in the cables, the Commissioners state that this was due to floods and violent storms; inferior quality of the forage, owing to the conditions under which it was grown; the extraordinary deficiency in the potato crop; and the epidemic of aqueous cachexy, &c., which decimated the sheep flocks. According to figures published by the Commissioners the prices during the three months preceding the issue of the report were back to a comparatively low level, almost to the mean rates for the years 1908–10. After referring to the increased prices of the value of Argentine beef, as well as that of Canada, the Commissioners remark that the fact should not be lost sight of that the available excess of meat in the great producing countries is year by year diminishing. The population of the United States is increasing enormously, and she exports less and less yearly of meat and wheat. Figures are given to show that the importation of frozen beef into England from the United States has greatly diminished. According to a table accompanying the Commissioner's report, the falling-off in the number of sheep in France between 1862 and 1910 was 12,390,000 head—a serious situation. The reasons suggested for this are the following: the intensive culture of to-day; the suppression of fallow land; the partition of large estates; the clearing of the land; the replanting of the mountain lands; and the difficulties of agriculturists in getting good shepherds, even with the promise of large salaries.

In view of this position the Commissioners consider the proposal to introduce foreign mutton by the lowering of the Customs duties "a very grave measure, bringing risk to the very interests that they wish to safeguard, and dealing a fatal blow to sheep-raising." As to the encouraging of the importation of meat from French colonies the report says: "The Government has considered all the difficulties of the situation, and has decided to facilitate the access to the markets of the metropolis of meat from our colonies by organizing sanitary inspection at place of shipment, and dispensing with the obligation regarding the adherence of internal organs in the case of dead meat therefrom."

As regards Madagascar, the herds of that island, according to the report, number over five millions of excellent quality, and it is expected that Madagascar, an important centre of pig-raising, can, if needs be, furnish the French consumer with appreciable quantities of bacon and pork. New Caledonia possesses, also, an excess of stock for exportation.

Concluding, the Commissioners say: "At the moment when our colonial policy occupies so important a place in our future preoccupations, is it not clear that when the occasion presents itself we should utilize the still latent resources of our far-off possessions and facilitate their access to our home markets without making a call on foreign countries? In binding more directly our interests to theirs, is it not the best means of assimilating them, and making them truly an enlargement of France?"

As to the special assistance to be afforded French farmers, the Commissioners recommend the organization of the meat trade and the facilitating of the purchase of foreign maize for feeding of stock by the temporary suppression of import taxes.

IMPORTATION OF AUSTRALIAN MUTTON INTO GERMANY.

THE High Commissioner explains the statement circulated through the British Press that a cargo of Australian meat was imported into Germany. He reports that it was a small trial parcel of 100 carcasses of Australian mutton forwarded by Messrs. W. Weddel and Co. These carcasses were slaughtered and dressed in Australia in such a manner as to comply with the German regulations, the necessary internal organs being left in the carcasses. They were wrapped in double Hessian bags, and shipped along with other frozen mutton to London. Here they were discharged, and were then forwarded to Bremen, Germany, by Messrs. Weddel and Co. They arrived there in good condition, and, overcoming the numerous difficulties of Customhouse, meat-inspection, &c., were sold by Messrs. Weddel's representative in two lots—fifty to Berlin and fifty to Chemnitz. I am informed, says the High Commissioner, that the meat gave entire satisfaction to the purchasers. The price realized, however, has not been ascertained.

SWISS REGULATIONS.

UNDER order of the Swiss Federal Council, dated 1st December last, reports the High Commissioner, only one certificate of origin will require to be produced and only one permit will be issued where imported meat comes from the same sender and goes to the same consignee. The certificate and permit will indicate the exact weight and number of the various kinds of meat. Also the inspection tax for meat and meat-preparations will be, for lots weighing 100 kilograms and over (1 kilogram = 2 lb. 3½ oz.), 1 franc (10d.) per 100 kilograms instead of 1.50 francs.

The following figures show the export of oats from New Zealand last year, and the destination of the various shipments: United Kingdom, 88 bushels; Victoria, 34,230; New South Wales, 2,643; Queensland, 2,592; South Australia, 789; West Australia, 207; Norfolk Island, 45; Fiji Islands, 2,740; Ceylon, 22,911; Uruguay, 65; Brazil, 1,945; Friendly Islands, 934; Navigators, 3,413; Society Islands, 212; Ellice Group, 12; total, 72,826 bushels, valued at £9,211.

FRUIT - PULP.

PROSPECTS ON BRITISH MARKETS.

THE following report on the fruit-pulp market of Britain, made at the request of the Department of Agriculture, Commerce, and Tourists, has been received from the High Commissioner :—

The market in London, which is the chief distributing centre for the commodity, can only be described as uncertain and speculative. That fruit-pulp can always be sold is true, but that the price realizable will be such as will prove remunerative to New Zealand producers is doubtful. The demand for fruit-pulp is dependent chiefly upon the result of the English fruit season—whether it is good or bad—and also, in a lesser degree, upon the European fruit crop. It is really only in a season when the English fruit crop is a comparative failure that high prices for the pulp are obtained. Even in such a season there is no certainty that high prices will rule, for jam-makers, who are the chief consumers, take the precaution to ensure themselves against future famine by retaining each year sufficient stock on hand to help to average the cost of their output for the following season.

The principal fruit-pulps imported are apricot, raspberry, black currant, greengage, and plum ; but strawberry, red currant, and gooseberry pulps are also received. Spain sends chiefly apricot, greengage, and plum, on the two latter of which there is an import duty of 7s. per hundredweight. Italy sends apricot : France, apricot, greengage, and raspberry ; while Holland sends raspberry, strawberry, black currant, red currant, and gooseberry. It may be said, however, that by far the largest consumption is of apricot and raspberry pulps. There is scarcely any demand for peach-pulp, little, if any, being used in this country.

There is a sale for fruit-pulp throughout the year. The best time, probably, for placing it on the market is September and October, just after the English fruit season has closed, and when jam-makers are busy and ready to continue manufacturing. The worst time is in November and December. Contracts for the sale of Continental pulp are usually made during June, July, and August, when the results of the English fruit season are ascertained.

As mentioned above, jam-makers are the principal users of fruit-pulp, although confectioners also purchase it to a small extent for fruit-jellies, &c.

Fruit-pulp is usually sold by private treaty. Very seldom is a parcel offered at auction, and then in all probability it would be a line that had to be realized, and for which a private buyer could not readily be found. The result would be, under present conditions, that at auction only speculative buyers would bid, and the price obtained would be correspondingly low.

Buyers are very particular as to the quality of fruit-pulp they accept, and in their contracts stipulate clearly that the pulp shall be pure fruit only, having no water, sugar, or preservative added to the fruit. In contracts for the purchase of apricot-pulp, they further stipulate that the fruit shall be halved, and the stones taken out. If the stones are left in there is greater risk of the pulp fermenting. They are also particular that the fruit shall be ripe, though not overripe, and not boiled so as to break it too greatly. The more whole the fruit is kept the better it will sell.

Of course, it must be clearly understood that jam-makers prefer in all cases to use the fresh-grown fruit and, if necessary, to make their own pulp rather than use the imported article. This, however, naturally cannot apply to apricots, which are not, practically speaking, grown in this country.

At the present moment raspberry and black-currant pulp, if on the spot, would sell well at probably from 42s. to 45s. per hundredweight. These figures are, however, nearly double those usually ruling, and must be recognized as being unusually high. The hot, dry summer last year experienced here and on the Continent caused the fruit-crop to be less than usual, and consequently pulps came into demand. Speculation is not evident, buyers preferring to wait until an estimate can be obtained of the English crop this year.

I have made inquiry amongst brokers handling fruit-pulp, but cannot ascertain what probable quantity of fruit-pulp is required on the markets of this country. As indicated above, the requirements depend upon the fruit season.

The package for fruit-pulp most generally acceptable here to the trade is the round tin, containing 10 lb., properly prepared and soldered so as to avoid risk of "blowing." These are usually packed for shipment in cases holding ten tins each, and they must be of sufficient strength to stand rough handling during shipment and discharge. This would give a package weighing about 120 lb. gross.

The following are the values per hundredweight of various fruit-pulps on the London market at the present time, and for the same periods of the two preceding years:—

					1912.	1911.	1910.
Apricot ..	..	..	..	..	27s.	16s.	11s.
Raspberry ..	..	..	..	..	43s.	28s.	23s.
Black currant ..	..	..	..	..	45s.	32s.	25s.
Gooseberry ..	..	..	..	..	16s.	12s.	11s.
Peach ..	..	..	..	..	18s.	nominal,	but

little, if any, demand—10 tons would oversupply the market.

Some years ago several shipments of raspberries and black currants, packed in casks and preserved by sulphur treatment, were received from New Zealand. These lots, after being subjected to rigid inspection and tests by the Health Officers, were admitted. They were sold to several users in London and elsewhere, who, after becoming acquainted with the proper mode of treating this pulp, obtained highly satisfactory results from it. I am of opinion that if similar pulp were shipped this year those buyers who previously handled it might be induced to do so again.

I would, however, desire to point out to fruitgrowers that if they wish to open up a trade in fruit-pulp they ought not merely to ship in years when prices are high, as they do at present, but should make regular yearly consignments to some reliable broker with a good connection amongst users. In this way they would establish a trade which probably, during a series of, say, five or seven years, would return them a payable average price. The only remunerative way to develop the industry is to ship regularly, irrespective of price, and take the average result.

It would be interesting to know what price is considered a payable one by the fruit-growers in New Zealand for the various pulps.

SISAL HEMP.

THE MEXICAN VALORIZATION SCHEME.

THE High Commissioner, under date of London, 9th February, furnishes full particulars of the Mexican Government's sisal valorization scheme, embodied in the law of 5th January, 1912.

To protect the industry a special tax ranging from $\frac{1}{2}$ c. to 1 c., according to the market value, per kilogram (2 lb. $3\frac{1}{4}$ oz.) is to be imposed on the production of raw material. The Government is to have the power to contract a loan of 5,000,000 pesos (peso = 2s. $0\frac{1}{2}$ d.). The capital and interest of this is to be paid off in instalments as proceeds are received from the special tax.

Article 6 of the law reads: "The Government shall establish in the City of Merida a Regulating Board of the Hemp Market, which shall consist of five members appointed by the Governor, who shall be Chairman. The principal duties of the Board shall be—(1) To receive and manage the funds to be used for the protection of the hemp industry; (2) to put through all mercantile operations which are considered necessary to raise and sustain the price of sisal to a level which shall be profitable to producers, in so far as competition with similar fibres permits; (3) to hold off the market as much hemp as is considered necessary to maintain the equilibrium between supply and demand, when production shall exceed consumption; (4) to use the overproduction, when there is no prospect of the natural and immediate consumption, for new industries for which the fibre may be adapted; (5) to open up new sisal markets; (6) to give all the impetus possible to the manufacture of sisal within the State."

The Government is to establish in the penitentiary of the capital a rope-walk for the use of Yucatan fibre. If at any time the fund shall become unnecessary for its special object it is not to be applied to any other public work or service, but is to be returned to the contributors in the proportion in which they have contributed. The profits produced by the commercial operations of the Regulating Board are to be used to promote and aid the manufacture of sisal within the State.

BRITISH EGG-MARKET.

At the end of last year Messrs. Reilly, Scott, and Gill, of Dunedin, made an experimental shipment of eggs to the London market, consisting of twenty boxes each comprising twenty-two dozen eggs. The shipment was handled by Messrs. H. A. Lane and Co., of London. When opened up and inspected the Government Produce Inspector was present, and he has furnished an official report on the matter. This reads,—

"I inspected the eggs on their arrival at Messrs. Lane's warehouse. The cases in which they were contained were strong and well made. It would be better, however, in future shipments, to have the cases made of rather lighter wood and larger in size. Those now received were of a size that could be handled by one man, and there was accordingly every inducement for them being handled rather carelessly and roughly, so causing breakage of the contents. Continental cases usually contain 1,440 eggs and weigh about 2 cwt. gross. I would suggest that wood similar to that of which cheese-cases are made should be used. The wood must, of course, be thoroughly dry, as the slightest moisture in the case would cause the eggs to deteriorate and have a musty smell.

"Each New Zealand case contained 264 eggs, which, after being treated with some sort of preservative—that unfortunately imparted to them a sticky feel—had been wrapped in tissue-paper. They were carefully packed in oat-husks. The oat-husks make an excellent packing, but neither the tissue-paper nor the preservative are considered necessary. Every one connected with the egg trade here maintains that eggs collected in spring, as these were, if carefully packed and shipped without delay, will keep in sound condition sufficiently long to reach the London market and realize good prices without the use of any preservative. The present shipment has been sold for 10s. 6d. per 'long hundred'—i.e., 120 eggs—net.

"Owing evidently to the rough handling of the cases, there were a good many broken eggs, and these naturally destroyed many of the others. Out of 5,280 eggs shipped 1,160 were damaged.

"All the eggs were stamped 'New laid.' This, of course, should not be done, as the mark is recognized on the market here as a guarantee that the eggs bearing it are newly laid. Of course, eggs coming from New Zealand could not be described in this way when offered by the retailers. New Zealand eggs should be shipped unstamped, so as to be sold on their merits, proved by tasting on arrival. No buyer, of course, is deceived by the stamp on them. They probably might be sold as fresh eggs."

Messrs. Reilly, Scott, and Gill make the following remarks on the above report :—

"With all due respect to the Commissioner's report, we think that it would be simply suicidal to ship eggs home to England if this precaution (treated with a preservative) were not taken, and unless the eggs were carried in a special chamber. Had the eggs not been wrapped in paper it appears to us that fully 50 per cent. of them would have been broken. However, it is possible that we might send another trial shipment Home next spring. We are thinking of shipping five thousand dozen in the preservative and five thousand without the preservative, and using either cardboard filling or wood-woollen packing. For the recent experiment we used one line of eggs from one of our very best consignors, whose eggs were all stamped and guaranteed new laid before sending to the market, and we let them go forward under this brand. We were informed by our agents that the buyers stated that the quality of the eggs was equal to the best overseas eggs in the market, though we regret to inform you that financially the experiment proved a dismal failure, the net price to us being 6½d. per dozen. Had we held them in our store until the present time they would be worth to us 1s. 3d. per dozen.

For the seven months of the fiscal year ending the 31st January, 1912, the United States decreased its purchases abroad by nearly £2,120,000; while its export record was £9,880,000 above that of the corresponding seven months of the preceding year.

ANSWERS TO CORRESPONDENTS.

TALL FESCUE.

"SUBSCRIBER," Raetihi, writes,—

Could you let me know whether the grass known as "giant fescue" is suitable for sowing as permanent pasture on light soil in a cold, wintry climate. Would it do better than cocksfoot, and would cows do well on it? Could it be ploughed out if it did not suit?

The Director of Fields and Experimental Farms replies,—

The grass known as "giant fescue," or "tall fescue" (*Festuca arundinacea*), is generally considered to be one of the most undesirable of grasses on any soil in New Zealand. On poor light soil it may not be quite unsuitable, but on any other soil it quickly becomes a pest, so much so indeed that in certain parts of New Zealand at the present time it is being asked that this grass may be included in the Third Schedule of the Noxious Weeds Act. It is also a continuous bearer of ergot. There is hardly a district in New Zealand where its presence is not considered injurious.

SHEEP-BREEDING.

"SHEEPFARMER," Gisborne, writes,—

I shall be very glad if you will tell me per your interesting *Journal* whether ewes are "in season" all through kipping time, or if during that time they keep coming on and going off periodically. If the latter, can you tell me how many days elapse from their one period to the next?

The Live-stock and Meat Division replies,—

The period of œstrum in the ewe is from one to two days, and the condition recurs if conception has not taken place in from seventeen to twenty days.

SALTING BUTTER.

F. HILGENDORF, Waitati, Otago, writes,—

Will you kindly inform me through the medium of your *Journal* of the course to be adopted to preserve butter by salting for household purposes in winter.

The Director of the Dairy Produce Division replies,—

Salt should be added to butter while the latter is in the granular form, and should be distributed as evenly as possible throughout the whole mass. The butter should then be worked until the salt has been well incorporated, after which it should be allowed to stand for two or three hours until the salt has dissolved, when it should be slightly reworked until the colour is quite even. The quantity of salt used may be from $\frac{1}{2}$ oz. to 1 oz. to the pound—the latter for preference where it is intended to keep the butter over the winter months. Thoroughly clean jars with tight lids are found most suitable for keeping the butter in at the ordinary dairy, and, failing these, a well-seasoned white-pine butter-box lined with parchment paper should be used. Care should be exercised to exclude the air as far as possible. As an additional preventive from deterioration, 1 oz. of butter-preservative to every 10 lb. of butter could be added along with the salt.

LIME, LUCERNE, DAIRY STOCK.

MR. G. S. CLARKE, Otorohanga, writes,—

Be good enough to inform me in your next month's *Journal* if the experience of the experimental farms in the Waikato advise using lime as a top-dressing and with crops, in conjunction with bonedust, superphosphate, and basic slag, or whether the last-mentioned has enough lime in itself. Would agricultural lime ground for drilling at 26s. per ton, or carbonate of lime at 18s. per ton, be advisable? The land I would apply it to is fairly new fern and tea-tree country, but has been in grass for a few years, and is situated in South Waikato.

Would flat to easy rolling country, or a newly drained swamp which, I think, would be somewhat sour, be best for lucerne? I have tried it twice on the former, but with indifferent results.

Have the different Government experiments shown, per acre, any advantage—apart from strain—of Jerseys, Holsteins, or milking Shorthorns as dairy cattle?

The Chief Agricultural Chemist replies,—

For clay lands burnt lime, and for light sandy or silty soils carbonate of lime is to be preferred.

The Director of the Fields and Experimental Farms Division replies,—

The quality of the soil rather than the natural features exercises the greater influence on all crops, including lucerne. Newly drained swamp land is not usually in a fit state to produce satisfactory crops of any plant, and probably least of all lucerne. It is recommended that the correspondent should visit Ruakura; it is in his district. The questions of lucerne can be discussed with the Manager and the results of top-dressings can be observed.

The Department has not undertaken experiments on comparative results per acre of different breeds of dairy cattle. Such an experiment would be difficult here where cows are depastured for the whole year.

GRASSES AND FODDER PLANTS.

“BROWN-TOP,” Gisborne, writes,—

I shall be glad of information as follows:—

Brown-top (a grass): In what parts and in what soils of New Zealand can I get practical proof of its growth, lasting qualities, and value for sheep pasture? I hear the grass is valuable for dry light soils on ridges sown after burning bush or hill country. To what height does it grow? In fact, all the information you can give me will be welcome. No one knows of it in this district. I also desire information regarding red-top. What other names do these grasses bear?

Regarding *paspalum*, what do you think of a small amount of this grass added to a bush mixture—*i.e.*, to sow hill country after burning light scrub and birch, more particularly on the hard dry ridges? Would it show any better results than cocksfoot where the rainfall is fairly light and the soil of a dry nature, yet near the sea-coast (Bay of Plenty), and the climate warm?

Kaffir-corn (non-saccharine sorghum): I have an idea that if one could grow this by sowing broadcast a small quantity mixed with the rye and cocksfoot and clovers of an ordinary mixture, in the same way as rape or turnip, it would prove profitable in view of the fact that it withstands the drought and still goes on growing even on light soils, thus producing early feed for hoggets—where rape and turnips would become fly-attacked and perish—at the same time providing shelter for the young spring grass from the dry destructive effects of a hot sun during dry weather. I am sure that if one could grow maize in this way, or varieties of maize, where the seed is small and would go further—that is, just scattered broadcast on the ashes after a burn. What do you think? Any information on these lines will be acceptable.

The Biologist has an article in this issue of the *Journal* on bent-grasses.

The Director of the Fields and Experimental Farms Division replies to the other queries as follows:—

Paspalum: This would not appear to be a grass suited to hilly country after burning light scrub and birch. *Paspalum* is practically a swamp-grass. Another name for this plant is Louisiana swamp-grass. This grass is in evidence on some of the Bay of Plenty country. It undoubtedly thrives best where the country is warm, but it has not been sufficiently observed to enable it to be compared with cocksfoot. In the opinion of most farmers cocksfoot is considered far more desirable.

Sorghum (Kaffir corn): The experiment you propose is well worthy of a trial. It is, however, doubtful if it would give useful results mixed with grass-seed to replace the rape or turnips which are usually sown with it. It is not likely to supply a heavy crop unless on fertile land: all plants of that description are gross feeders. It is also to be questioned if such a plant would not militate considerably against the formation of a permanent pasture.

Many plants will grow scattered on the ashes after a burn on heavy bush. Such experiments as you propose are to be commended, and any report from you on the results you obtain will be appreciated.

WEATHER AND CROPS.

MARCH.

OFFICERS of the Fields and Experimental Farms Division of the Department report as follows on the condition of the pastures and the crops during the past month:—

AUCKLAND.—In previous years March weather has been mostly favourable, but the weather of the past month was an exception to the rule. Easterly winds, rain, and squally weather indicated the approach of the winter. The heaviest downpour was on the 6th instant: this was accompanied by thunder and lightning. Right up to the close of the month light showers fell at intervals. Finally, warmer weather prevailed, which improved the pastures and root crops. Stock in general are looking well, owing to the abundance of feed. The dairy factories are still receiving milk. The majority of the settlers are cultivating and preparing the land for sowing their grass-seeds. Everything points to a considerable area being laid down in grass this year.—*R. Rowan*.

TE AROHA.—The weather in March was good, particularly in the latter part of the month. Owing to the abnormal fall of rain in the previous months the fair warm weather experienced lately has given pastures and root crops a good start, and, with the absence of frost for a time, there will be plenty of winter feed. The butter-fat returns are high this season, and the supply is likely to keep up a few more weeks, as the pastures are particularly good.—*J. L. Morris*.

TE KUITI.—The first half of the month was very wet, rain falling every day. This was beneficial to pastures and to growing root crops. Late crops of oats harvested this month were damaged in the stook. A number of owners of fallen bush fired their clearings in the latter part of the month with indifferent results. The major portion of the fallen-bush area is yet unburnt.—*B. Bayly*.

MANGAWEKA.—The month of March was excellent for grass. There is no doubt the past season has been good: still, had there been more sunshine the grass would have been of better feeding-value, with the result that stock would have fattened better, and crops of all kinds would have ripened sooner and have been harvested in a more satisfactory condition.—*J. A. Melrose*.

OHAKUNE.—The weather for the greater part of March was exceptionally unseasonable, the rainfall for the month being 5.94 in., 2.87 in. falling on the 2nd. Oats have been very late in maturing, and on the majority of farms have just been cut and stooked. Turnips, mangels, and carrots are looking remarkably well, and promise to prove a valuable asset to farmers who have thus fortified themselves against the long and severe winter generally experienced here. Pastures are still good.—*P. Barry*.

TAIHAPE.—The weather during the month has been fairly wet. Rain fell on fourteen days. The heaviest fall was on the 2nd, being 3.315 in. This is the greatest fall recorded in this district for the past twelve years. The fly has played havoc with the late turnips, more especially on the newly burnt bush country. There is an abundance of feed everywhere.—*A. P. Smith*.

NEW PLYMOUTH.—Frequent showers during the first part of the month delayed harvesting, but with the exception of a few local showers the weather for the last fortnight has been fine with cold nights and heavy dews. The country is looking very well, with an abundance of grass. All root crops are making satisfactory growth, while the number of stacks of hay, corn, and ensilage are far in excess of the number built last year. This should enable the farmers to winter their stock well and to start the milking season with their cows in good condition, which, if a good return is required, is most important. The majority of farmers are now busy with ploughing and sowing their autumn crops.—*R. E. Fairfax-Cholmeley*.

HAWERA.—Very unsettled weather has been experienced throughout the month—cloudy days with frequent showers, with a suspicion of frosts at nights and occasional high winds. This has retarded harvesting of late crops in the early part of the month.

but the moist weather has been very beneficial to pastures, root and green crops generally. The grass-grub, which caused considerable trouble last year, is not much in evidence this season, and I have not as yet heard of any complaints. Harvesting is now completed, and threshing is in full swing. The expected heavy yields are being fully realized. The milk-supply at factories is holding out well, and is much better than in the corresponding month of last year.—*A. J. Glasson.*

STRATFORD.—Frequent heavy rains have interfered with the harvesting of grain crops. In some cases the oaten hay has lain in the paddocks for a fortnight, and is therefore considerably discoloured. It has been a good growing month for all root crops. Pastures are looking well.—*Austin F. Wilson.*

WANGANUI.—The worst features of the weather experienced since the middle of October last have continued during March—viz., frequent showers, absence of sunshine and warmth, and considerable wind at frequent intervals. The completing of harvesting operations has been especially difficult owing to the absence of lengthy dry periods, and in some cases considerable loss must have resulted. Root crops are looking well. There is an abundance of feed in the pastures, but it is lacking in quality.—*C. Watson.*

WAIKURAU.—Having had several days of warm rain at different intervals with bright sunny days following, pastures, &c., have made good growth, there being good feed everywhere where country has not been too heavily stocked. Autumn and winter prospects are good.—*H. O. M. Christie.*

PAHIATUA.—During the first three weeks of the month we had north-westerly winds, which began to have a bad effect on the autumn feed. The latter part of the month has been like summer, but we are having cold nights and frosts. The latter are causing the maize to have a withered appearance. Otherwise the few warm days has caused a good growth in the grass. Total rainfall for the month, 4.56 in. Rain fell on thirteen days, the maximum fall, 1.30 in., being on the 15th.—*Thomas Bacon.*

NORTHERN WAIRARAPA.—The weather has been anything but good for this time of the year, and if we do not get warm dry weather shortly stock will suffer in the winter. There is abundance of feed, but it is very soft and watery, and may not withstand the frosts; consequently stock will suffer. The weather-conditions are favourable for turnips and all root crops.—*J. S. Rankin.*

MASTERTON.—The past season has been one of the most extraordinary ever experienced in this district. There has been practically no summer, and winter seems to have arrived before we have fairly got into autumn. Grass is in abundance, but is lacking in substance. Grain-yields have been all exceptionally good, and fair yields are expected from the potato crops.—*T. C. Webb.*

SOUTH WAIRARAPA.—During the early part of the month heavy rains were experienced, with severe frosts, which cut down the root crops. Fine weather was experienced towards the end of the month. Poisoning operations are in full force, and rabbits are taking the poison fairly well.—*S. C. Ivens.*

NELSON.—The pastures and root crops are still looking well, owing to the showers of rain that fell during the month. There is plenty of feed, and stock are looking well. The grain crops are all harvested, and the threshing-machines are very busy. Farmers are now ploughing their stubble paddocks. Potatoes look well, though there is a little blight in places.—*Gilbert J. Ward.*

MARLBOROUGH.—The weather has been most changeable, two or three warm days like summer, then a change to cold and wind and an occasional frost, but not hard enough to do harm. A little rain fell during the month, sufficient to freshen pastures, which are looking very well. Winter feed is now assured.—*F. H. Brittain.*

WESTLAND.—March has been a mild month, and a good deal of rain has fallen, 7.79 in. having been registered to date (28th). The farmer has had a trying summer through the continual wet weather, and has been hampered considerably in his operations. Owing to the wet summer burns have been most unsatisfactory in all parts of the district. There is an abundance of green feed.—*J. H. Walton.*

ROTHERHAM.—The weather for the past month was very mild, and favourable for all kinds of green crops and pastures. Rain fell on only one day, and this was followed by some days of heat, which was required for the autumn-sown crops. Harvesting is now completed throughout the district, and threshing is in full swing. The yields are very satisfactory. In the Cheviot district oats yielded up to 90 bushels per acre; wheat also giving very high yields.—*W. M. Munro.*

ASILEY.—The weather has been much more favourable this month, and nearly all the harvest is in. There have been a few showers during the month, but they did little

harm. The grain-yield as a whole has been good, but not quite up to what it promised to be earlier in the season. Potatoes have turned out fair, but not what was expected—too many small ones. There is not much disease about, although the wet weather has caused a lot of rot. Peas have done fairly well, but here again the wet is responsible for a deal of loss. Owing to the wet season, the grasses and clovers have not filled with seed. I have noticed a great scarcity of bees amongst the clover as compared with other years.—*A. Hughes.*

LINCOLN.—Throughout the month there were few really hot days, and a marked absence of the winds usually prevalent in March. Though somewhat variable, as in keeping with the season, the weather generally was suitable for harvest-work and enabled growers to get their grain safely in. Grass is very plentiful, both in pasture and stubble.—*J. G. Scott.*

FAIRLIE.—A good deal of wet weather has been experienced during the month. Harvest has been delayed considerably, and there is still a large area of crop to be stacked. There are no complaints this season of rust or smut in the crops. Potatoes will yield better than expected. Lambs are now fattening well. Pastures are still good. The season is proving one of the best for feed experienced for some years.—*W. B. Manning.*

TIMARU.—The weather still keeps very unsettled, constant showers of rain with north-west warm and cloudy weather being experienced. The harvest is all in now and threshing is general. Ploughing is well under way for winter wheat. There is a great growth of grass, and every prospect of good winter feed.—*J. C. Huddleston.*

WAIMATE.—March has not been in any way a perfect month from an agricultural point of view. Harvest-work has been much hindered by rain: this has caused considerable delay in stacking and stook-threshing. Heavy yields of cereals are expected, and, judging from grain already threshed, the returns for the present season will be much above the average for this district. Pastures are good, and feed is very plentiful on the high country. Indications are for an ample food-supply for winter. Turnips look well, as do mangels, but there is a tendency for these to go to seed. Potatoes are showing evidence of blight, and in certain localities have been touched with frost. Where spraying has been carried out improved conditions are noticeable. The grass-seed harvest has been good, and some good crops of peas, beans, and linseed are noticeable. The present outlook for pastoralists and farmers is very promising.—*F. A. Macdonald.*

KUROW.—March has been a splendid month for the Upper Waitaki district, the prevailing showers having kept the grass showing, with the result that feed is in abundance everywhere. Stock are in good heart to face the approaching winter. The farmer, as well as the runholder, has experienced a good season, crops having, on the whole, turned out well. The Hessian fly and the caterpillar made their appearance in some of the wheat and barley crops, but no great extent of damage resulted. The potato-moth is also in evidence, but the showery weather seems to be checking the destructiveness of the pest.—*G. Reid.*

NORTH OTAGO.—Harvesting operations are in full progress, but through scarcity of labour and the continual wet weather farmers are being greatly hampered. We do not get a fine week on end, and all farm-work is very much behind. Blight has made its appearance among the potato crops, but as the tubers are very near maturity I do not anticipate much loss. Rape, turnips, and mangels are looking well, and feed for the winter is assured.—*S. M. Taylor.*

PALMERSTON SOUTH.—The weather still continues broken, and the harvest has been a prolonged one, but it is now nearing a finish. Odd crops of oats have to be stacked and odd crops of wheat have to be cut. Late-sown wheat has ripened very slowly, and is damaged by frost. Threshing is in full swing, and good yields are reported. Harvest is much later in Macrae's and Moonlight districts, and it will be well on in April before it is finished. Root crops are not doing well, the weather being too wet and cold. Pastures are good.—*C. S. Dalgliesh.*

DUNEDIN.—The weather during March has been wet and cold—most unsuitable for harvesting operations—in fact, the worst experienced for years. Mangel crops, with a few exceptions, are a failure. The same applies to turnips. In some cases farmers have only finished thinning this month. Potato crops are even lighter than was anticipated last month. The pastures are good, and should last right on until the middle of the winter.—*J. R. Renton.*

LAWRENCE.—The weather in March was very broken—cold and wet. It has seriously retarded the ripening and harvesting of crops; probably about one-third of the crops are cut, with only a small portion stacked. The rainfall was 4.30 in., rain falling upon nineteen days. If the weather does not become more favourable a good

deal of crop will be of a very poor sample; in fact, it will be next to an impossibility to save it.—*R. Barron.*

TAPANUI.—Very showery weather was experienced during March. Harvesting of grain is now in full swing, but weather-conditions are much against the work. Wheat and oat crops are coming in, but are a very bad colour. Turnips are looking very fair, although late; much depends on the weather during next month for this crop. Barley has been threshed, and some of the yields have been very good.—*W. J. McCulloch.*

OTAUTAU.—The weather is still unsettled—hardly more than two or three fine days at a time. Harvesting operations have been greatly hampered. What should have been a record season for grain will be much below the usual. In many cases the yield will be less, especially in wheat, owing to a deal of it being frosted. A fortnight of fine bright weather would see most of the grain harvested. The grass crops in some cases are totally ruined, and are not worth collecting. Feed is plentiful.—*H. F. Dencker.*

MANIOTOTO.—Splendid rains have fallen, giving grass and vegetation a luxuriant appearance. Turnips have made fair progress during the month. This, together with plenty of rough feed, will keep stock well throughout the winter. In Paerau (Styx) district the farmers are complaining greatly of the havoc paradise ducks are doing to turnips. The ducks are very plentiful, and if an open season were granted it would be more satisfactory to the acclimatization society than to have them all poisoned.—*A. T. N. Simpson.*

OWAKA.—The weather in March was very rough and changeable; there was not a whole dry week throughout the month. In some portions of the district crops are all cut and in stook or stack. In others they are quite green, while in some places they are lying down very badly, owing to rough weather. A good many farmers are just cutting oats for hay; but it is a great contract getting it dry. Potatoes seem to be suffering from blight. A large quantity of turnips have gone to seed, and farmers have been obliged to turn sheep in to eat them off. In other places where they were sown late they are coming along slowly. Pastures are looking fairly well.—*Thomas D. Urquhart.*

THE FRUIT CROP.

OFFICERS of the Orchards, Gardens, and Apiaries Division report as follows on the condition of the fruit crops for March:—

WHANGAREI.—Heavy rain at the beginning of the month caused a considerable amount of fruit to fall, and in some cases growers were heavy losers. Only the later varieties of peaches are left. The promise of a full crop of pip fruits, as mentioned in December report, has been fully realized. Bitter-pit is bad in the Wairoa. Tomatoes, which have been a good crop, are nearly finished.—*J. W. Collard.*

AUCKLAND SUBURBS.—The first portion of the month was mostly wet, with latterly fine sunny days and cool nights. Prices, as anticipated, are now on upward grade. Plums are nearly over, and peaches are getting scarce, with only the later varieties commanding good prices. There is an improvement in the demand for the best classes of apples and pears, but the large quantity of inferior grades coming to hand is keeping prices low. Another factor keeping prices down is the large quantity of immature fruit reaching the market. Late apple and pear crops are fully up to expectations.—*W. R. L. Williams.*

HAMILTON SOUTH.—Weather conditions were unseasonable—wet and stormy throughout the month. The apple-supply was heavy, but prices are not very high. Peaches are almost finished, and prices hardened towards the end of the month. The pear crop is good.—*N. R. Pierce.*

HASTINGS.—The past month practically ends an excellent stone-fruit season. The later varieties of pears and apples are still in abundance.—*J. A. Campbell.*

WANGANUI.—The congenial weather of March is well maintaining prospects of fruit crop. The strawberry season closed during the month with a few cases of Egmont Seedling. Late peaches are all about picked. Late apples, pears, and quinces are now the feature in the orchards, the full crops of commercial varieties thoroughly demonstrating their right to be included under that heading. Potatoes are showing slight

moth and Irish blight, but full crops of sound quality have been noted. Onions are showing effects of attacks of fungus blights, but this is not surprising considering the season.—*W. C. Hyde.*

PALMERSTON NORTH.—Growers are busy handling crops of apples and pears in the Manawatu district. The bulk of the fruit is good, a large percentage being first grade. Peaches have been very cheap owing to big crop in Hawke's Bay district, consequently there is a lot of waste. During the last few weeks tomatoes have been attacked by blight. In the Wairarapa district apples turned out very well. Pears are medium, there being a considerable amount of cracking in some varieties. A hailstorm did much damage to the fruit crops in the Greytown district.—*George Stratford.*

NELSON.—The weather is fine, although the ground is rather dry. Two shipments of apples left for South America during the month. Picking is now in full swing, and crops are turning out well.—*J. L. Williams.*

CHRISTCHURCH.—Prices for apples and pears have been very low during the month, partially caused by the heavy winds bringing large quantities of apples and pears to the ground, and these had to be marketed at once. Also, owing to sharp frosts, late varieties of apples have matured earlier than usual, quite the reverse to what was expected for such a cold and unfavourable season. Late apples are turning out well and quite up to expectations.—*W. J. Courtier.*

TIMARU.—A good deal of showery weather has been experienced again this month throughout the district, causing some varieties of pears to scab and split. Some late varieties of apples are also showing signs of scab. Plums and apricots are about finished, and late peaches are in fair supply. Apples and pears are very plentiful, consequently prices are low. Tomatoes are only in fair supply, and great trouble is being experienced in ripening outdoors owing to cool weather conditions. Potatoes are reported as being good crops, very little disease being noticeable.—*J. H. Thorp.*

DUNEDIN.—The apricot season is over. Late plums are being picked. The outlook for late varieties of peaches is not very promising, owing to weather conditions, which are altogether against their chance of ripening. Apple and pear crops are looking well. Central Otago is notable for its immunity against black-spot, and this season has proved no exception, although it was such a favourable one for this destructive fungus.—*W. T. Goodwin.*

THE HONEY CROP.

THE Director of Orchards, Gardens, and Apiaries Division has received the following reports on the honey-crop prospects from Apiary Instructors:—

AUCKLAND.—The yield on the whole has been poor, only about half-crops being reported on the average. North Auckland has had only a fair crop, also South Auckland, but considerably less than last season. Waikato and Thames Valley produced less than half-crops. The quality is excellent, and higher prices are being asked and obtained.—*G. V. Westbrooke.*

WELLINGTON.—The crop in the Wellington Province, east coast, is much below the average. On the west coast there is little or no surplus. In the Taranaki Province it is much below the average all through. Hawke's Bay and Poverty Bay have a very poor honey crop.—*F. A. Jacobsen.*

CHRISTCHURCH.—Owing to the unseasonable weather this season's honey crop is very light.—*E. G. Kenny.*

DUNEDIN.—The season has been a disastrous one generally. At the opening the outlook was promising, and it was thought that a record honey crop would result; however, the continued unsettled weather prevented the bees from working, and feeding had to be carried out to keep them from starving. There will be very little honey for marketing this season so far as this district is concerned.—*E. A. Earp.*

The first shipment of Tasmanian apples for South American ports passed through Wellington at the end of March. The shipment comprised 13,008 cases, and was consigned to the following ports: 4,315 cases for Rio de Janeiro, 4,248 cases for Buenos Aires, and 4,445 cases for Monte Video.

SHIPMENTS OF PRIMARY PRODUCE FROM NEW ZEALAND TO UNITED KINGDOM.

COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.	Mutton, Carcases.	Lamb, Carcases.	Beef, Quarters.	Butter, Boxes.	Cheese, Crates.	Wool, Bales.	Wheat Sacks.	Oats, Sacks.	Rabbits, Crates.	Hemp, Bales.	Tow., Bales.	Kauri- gum, Cases.	Sundry.
January,	1912 237,284	302,399	13,424	114,512	64,005	95,994	..	.. 16	7,295	6,365	1,942	3,407	59 carcasses pork.
"	1911 175,337	287,120	13,568	90,405	46,375	127,199	..	..	399	15,234	9,302	7,114	590 "
February,	1912 208,424	273,246	13,052	101,544	62,398	106,074	607	..	..	6,831	1,615	1,056	..
"	1911 242,090	450,406	24,924	86,868	46,667	70,030	23,694	200	..	4,428	1,302	2,113	1,369 carcasses pork.
March,	1912 324,192	518,402	20,201	64,925	49,308	70,022	..	4,980	..	3,832	1,352	2,644	16 carcasses pork.
"	1911 264,297	665,822	26,657	45,912	40,668	58,362	40,276	..	..	3,650	1,583	8,982	2,408 "
April,	1911 172,503	491,413	19,106	14,823	33,411	42,917	38,456	6	..	9,233	1,827	2,577	2,431 carcasses pork.
"	1910 209,120	559,166	29,355	46,524	44,032	32,920	21,855	1,934	12	10,179	2,951	4,250	627 "
May,	1911 304,390	377,105	20,173	995	20,732	33,033	98,854	..	..	7,443	1,210	7,720	1,087 carcasses pork.
"	1910 310,196	622,232	38,276	9,588	28,384	25,123	81,052	..	3,010	10,017	2,346	3,150	1,293 "
June,	1911 214,070	448,432	15,789	..	6,323	19,568	39,422	..	14,128	4,763	525	5,528	2,434 carcasses pork.
"	1910 259,596	555,777	60,286	485	17,963	21,260	13,707	..	8,988	6,180	2,684	7,104	658 "
July,	1911 206,869	260,761	14,296	..	276	14,100	29,452	..	10,334	6,022	1,073	2,786	175 carcasses pork.
"	1910 249,906	334,753	71,160	..	595	12,816	20,604	1,106	8,649	6,695	1,437	8,272	2,448 "
August,	1911 66,608	110,054	3,653	..	..	5,260	31,976	..	18,231	3,443	303	3,475	203 carcasses pork.
"	1910 94,468	97,899	16,440	634	..	5,381	33,970	273	22,629	1,378	720	6,793	362 "
September,	1911 102,081	40,057	6,059	6,404	..	7,390	38,151	..	33,059	5,604	393	7,672	220 carcasses pork.
"	1910 104,925	26,416	8,420	22,614	41	6,539	40,876	3,863	7,721	2,680	597	1,682	255 "
October,	1911 9,417	2,043	100	49,626	11,501	2,182	..	..	32,094	4,514	754	2,982	..
"	1910 49,010	800	10,531	60,014	9,159	3,189	94,815	23,330	36,947	3,632	1,232	3,089	56 carcasses pork.
November,	1911 47,770	10,427	403	135,741	57,319	44,934	15,833	..	16,606	7,844	2,183	3,085	..
"	1910 62,926	29,877	5,554	105,759	27,749	55,551	76,594	331	23,646	6,850	2,300	4,339	911 carcasses pork.
December,	1911 72,192	91,965	765	109,397	46,883	54,297	..	..	4,366	5,719	1,364	2,708	..
"	1910 82,405	157,172	13,155	182,051	67,162	59,080	..	..	9,716	4,524	109	5,363	686 carcasses pork.

HEMP AND TOW GRADING RETURNS.

MARCH, 1912.

Hemp.—The total number of bales graded was 9,343, as compared with 9,270 bales for the corresponding month of last year, an increase of 73 bales. For the twelve months ending 31st March, 1912, the number of bales graded was 85,684 as compared with 113,528 for the previous twelve months, the decrease being 27,844 bales.

Tow.—During the month 2,678 bales were dealt with, as compared with 2,480 for the corresponding month of last year, an increase of 198 bales.

HEMP AND TOW GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF MARCH, 1912.

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.	Common.	Rejected.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland	155	479	153	1	..	788
Napier
Foxton	2,046	2,212	75	21	..	4,354
Wellington	144	2,087	1,319	28	..	..	3,578
Blenheim
Pictou	70	6	59	..	..	..	135
Lyttelton	51	..	..	..	..	..	51
Dunedin	71	10	32	..	..	..	113
Bluff	25	278	21	..	..	324
Totals	336	4,329	4,379	277	22	..	9,343
Percentages of totals	..	3.6	46.4	46.8	3.0	0.2	..	100

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	92	81	40	213
Napier ..	..	..	..	..	..
Foxton ..	254	602	91	..	947
Wellington ..	480	578	68	89	1,215
Blenheim ..	..	..	..	..	..
Pictou ..	20	21	54	..	95
Lyttelton ..	30	16	..	..	46
Dunedin ..	..	14	..	..	14
Bluff ..	..	45	96	7	148
Totals ..	784	1,868	390	136	2,678

Stripper-slips passed for Shipment. — Foxton, 192 good-fair; Wellington, 119 good-fair, 32 condemned; total 343.

STOCK EXPORTED.

MARCH, 1912.

THE following table shows the numbers and descriptions of stock exported from the Dominion :—

Port of Shipment.	Horses.			Cattle.		Sheep.			Swine.
	To Australia.	To Pacific Islands.	To Singapore	To Australia.	To Pacific Islands.	To Australia.	To Pacific Islands.	To India.	To Pacific Islands.
Auckland	107	5	..	..	37	..	102	..	24
Gisborne	5	..	..	..	..	..	..	..	..
Napier	21	..	..	..	..	..	..	..	..
Wellington	166	..	..	6	..	2	..	..	..
Lyttelton	168	..	..	..	..	81	..	..	..
Dunedin	63	..	..	..	..	2	..	9	..
Bluff	70	..	..	..	..	23	..	..	..
Totals	600	5	..	6	37	108	102	9	24

The following are particulars of the horses shipped: 496 draughts (89 stallions, 284 mares, 81 geldings, 22 colts, 15 fillies, 5 foals), 7 half-draughts (4 mares, 3 geldings), 1 medium-draught gelding, 47 thoroughbreds (15 stallions, 7 mares, 3 geldings, 9 colts, 12 fillies, 1 foal), 9 hackneys (4 mares, 5 geldings), 33 light horses (1 stallion, 20 mares, 12 geldings), 10 ponies (5 stallions, 3 mares, 2 geldings), 2 trotting geldings.

STOCK IN QUARANTINE.

THE following stock was received into quarantine during the month of March :—

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
MOTUIHI ISLAND (AUCKLAND).					
Nil.					
SOMES ISLAND (WELLINGTON).					
2	Romney rams	Male ..	Liverpool ..	F. B. Farmer	.. Featherston.
7	Romney ewes	Female ..	" ..	"	.. "
QUAIL ISLAND (LYTTELTON).					
1	Collie bitch..	Female ..	London ..	James Lilico	.. Lochiel.
6	Pups*				

* Dropped on voyage.

PRODUCE IMPORTED.

THE following return, compiled by the Customs Department, shows the total importations into New Zealand during the month of March of agricultural and farm products:—

Item.	Quantity.	Value.
		£
Bran	tons	..
Butter	cwt.	..
Cheese	1 cwt.	4
Chaff	1 ton	9
Fruits, fresh, all kinds	1,051,382 lb.	7,459
Barley	centals	..
Oats	centals	..
Wheat	12 centals	5
Onions	355 cwt.	153
Pollard and sharps	165 tons	960
Potatoes	tons	..
Seeds, grass and clover	2,147 cwt.	7,773
Total values imported .. .. .	..	£16,363

ARGENTINE TRADE WITH BRITAIN.

THE Department has received the following cablegram from Buenos Aires, dated 3rd April, 1912:—

“The following shipments of produce were despatched from the Argentine to the United Kingdom ports during March, 1912 (compared with March, 1911):—

	1912.	1911.
Frozen beef (quarters)	179,000	255,136
Chilled beef (quarters)	202,000	90,084
Frozen mutton (carcases)	199,000	159,876
Frozen lamb (carcases)	66,000	193,053
Butter (cwt.)	9,516	900

AGRICULTURAL-SHOW DATES.

THE WINTER FIXTURES.

May 23-24.	Clutha and Matau Winter Show, at Balclutha.
June 4-7.	Otago Winter Show, at Dunedin.
June 4-8.	Waikato Winter Show at Hamilton.
June 5-8.	Taranaki Winter Show, at New Plymouth.
June 12-15.	Dominion Dairy Show, at Hawera.
June 13-14.	Ashburton Winter Show, at Ashburton.
June 18-19.	Southland Winter Show, at Invercargill.
June 25-28.	National Dairy Show, at Palmerston North.
Aug. 12-17.	National Agricultural Show of Queensland, at Brisbane.

Secretaries of rural show societies in general are requested to forward the dates of the shows of their organizations as soon as available, for notification in this *Journal*.

THE BRITISH PRODUCE MARKET.

HIGH COMMISSIONER'S CABLED MARKET REPORTS.

THE Department of Agriculture, Commerce, and Tourists has received the following cablegrams from the High Commissioner for New Zealand. (NOTE.—Quotations, unless otherwise specified, are average market prices on spot.)

London, 9th March, 1912.

General.—Strike is seriously impeding business.

Mutton.—The market is dull. Canterbury 4d. (nominal), North Island 3½d., Australian 3½d., River Plate 3½d., per lb.

Lamb.—The market is steady, although there is less demand. Canterbury 5½d., other than Canterbury 5d., Australian 4½d., Plate 4½d., per lb.

Beef.—The market is dull. New Zealand are not quoted; none offered in the market.

Butter.—The market is lifeless. There is only a small demand; buyers are cautious. The average price for the week for choicest New Zealand butter is 127s., Australian 123s., Argentine 122s., Danish 136s., Siberian 126s., per cwt.

Cheese.—The market is firm. There are small supplies on hand. New Zealand white 73s. 6d., coloured 73s., per cwt.

Hemp.—The market quiet but steady. No change in prices, viz.—Spot—New Zealand good fair £21 10s., fair grade £20 10s., fair current Manila £21 10s., per ton. Forward shipment: New Zealand good fair £21 10s., fair grade £20 10s., fair current Manila £22, per ton. The output from Manila for the week was 30,000 bales. Stock New Zealand hemp, 301 tons.

Wool.—The second series of colonial-wool sales, which were postponed, will commence on 11th April.

Wheat.—The market is a shade weaker, in anticipation of heavy arrivals.

Mutton and Lamb.—River Plate shipments received during February, 1912:—

					Mutton. Carcases.	Lamb. Carcases.
London ..	..	..	..	..	71,794	23,184
Liverpool ..	..	..	..	..	156,112	48,087
Hull ..	..	..	..	..	6,128	1,152
Newcastle ..	..	..	..	..	12,633	1,640
Southampton ..	..	..	..	..	12,428	12,401
Cardiff ..	..	..	..	..	8,361	500
Plymouth ..	..	..	..	..	1,118	620
Ireland ..	..	..	..	..	3,862	60
					272,436	87,644
February, 1911 ..	..	..	..	..	294,873	54,747

London, 16th March, 1912.

General.—On account of the continuation of the strike, there has been no material change in the market. Business is dull. Prices are nominal, and unchanged from last week, viz.:—

Mutton.—Canterbury 4d., North Island 3½d., per lb.

Lamb.—Canterbury 5½d., other than Canterbury 5d., per lb.

Beef.—New Zealand not quoted.

Butter.—Choicest New Zealand 127s. per cwt.

Cheese.—Finest New Zealand white 73s. 6d., coloured 73s., per cwt.

Hemp.—Spot—New Zealand good-fair grade £21 10s., fair grade £20 10s. Forward shipment: New Zealand good-fair grade £21 10s., fair grade £20 10s., per ton. The output from Manila for the week was 13,000 bales.

Hops.—The market remains firm, on account of the difficulty in obtaining supplies. English £13, Californian £12, per cwt.

London, 23rd March, 1912.

General.—No change in strike.*Mutton*.—There is a better demand, especially for light weights, which are scarce. Canterbury a small supply, nominally 4½d. per lb., North Island 3½d. per lb.*Lamb*.—The market is firm. The supply of Canterbury falls short of the demand. Nominally Canterbury 5½d., other than Canterbury 5¼d., per lb.*Beef*.—The market is firm. Stocks of New Zealand beef on hand are light. Supplies of American chilled beef are small. New Zealand hinds 4d., fores 3½d., per lb.*Butter*.—The market is quiet, but holders are firm. Stock is moderate. The average price for the week for choicest New Zealand butter is 127s., Australian 123s., Argentine 122s., Danish 136s., Siberian 126s., per cwt.*Cheese*.—The market is quiet but firm; a small supply. The average price for the week for finest New Zealand cheese is 74s. 6d., English Cheddar 92s., per cwt.*Hemp*.—The market is quiet; small business doing. Spot—New Zealand good-fair grade £21 10s., fair grade £20, fair current Manila £21 10s., per ton. Forward shipment: New Zealand good-fair grade £21 15s., fair grade £20 5s., fair current Manila £21 15s., per ton. The output from Manila for the week was 28,000 bales.*Kauri-gum*.—The market is very quiet; nothing doing. Nominally, no change in prices, viz.: Dark-brown selected rescraped £6 to £7 10s., dark-brown three-quarter-scraped £4 5s. to £4 15s., dark-brown chips (drossy) £1 10s. to £1 15s., rescraped pale amber £10 to £12, three-quarter pale scraped £7 to £8, diggers' chips (good) £2 5s., per cwt. Stock, 132 cases.*Wool*.—The market is firm, with improved demand. Current quotations for Bradford tops: 36's low crossbreds 1s. 1d., 40's low crossbreds 1s. 1¼d., 44's medium crossbreds 1s. 1¾d., 50's halfbreds 1s. 5d., 56's quarterbreds 1s. 7½d., 60's merinos 2s. 0½d., per lb.

London, 26th March, 1912.

Eggs.—There is a fair demand for better grades, in anticipation of Easter. Supplies are increasing; home supplies are plentiful. The strike is seriously impeding business. Home 8s. to 9s., Italian 7s. 6d. to 9s. 3d., Danish 8s. 3d. to 10s. 3d., Austrian 6s. 6d. to 7s. 9d., per 120.*Poultry*.—There is a fair local demand; the supply is small, but constant. Chickens: Home 11d. to 1s., Russian 8½d. to 9½d., American 8½d. to 10½d., per lb. Ducklings: Home 1s. to 1s. 3d., Russian 6d. to 7d., Chinese 5½d. to 6½d., per lb. Turkeys: French 10d. to 1s., Italian 8d. to 9d., per lb.*Bacon*.—The market is rather quiet. Sides: Irish 56s. to 69s., Danish 52s. to 63s., Russian 50s. to 54s., Canadian 53s. to 58s., per cwt.*Hams*.—The market is quiet but firm. English 88s. to 104s., Irish 86s. to 100s., Canadian 58s. to 68s., American 54s. to 58s., per cwt.

London, 30th March, 1912.

General.—The strike is subsiding. There is a proposition to settle the strike by arbitration.*Mutton*.—The market is firm. There is more demand for light weight. Canterbury are not quoted. The average price (nominally) is 4½d., North Island 3½d. to 4½d., per lb.*Lamb*.—The market is firm. There is a good demand for all lamb. Canterbury 5½d., other than Canterbury 5¾d., per lb.*Beef*.—The market is firm. A limited supply. New Zealand hinds 4½d., fores 3½d., per lb.*Butter*.—The market is slightly weaker, with less demand. Buyers are cautious. The weather continues favourable for home production. The average price for the week for choicest New Zealand butter is 125s., Danish 132s., Australian 121s., Argentine 121s., Siberian 123s., per cwt.*Cheese*.—The market is quiet; prices slightly weaker. The average price for the week for finest New Zealand cheese is 74s. per cwt.*Hemp*.—The market is about the same. Spot: New Zealand good fair £21 10s., fair grade £20, fair current Manila £21 10s., per ton. Forward shipment: New Zealand good fair £21 15s., fair grade £20 5s., fair current Manila £21 15s., per ton. The output from Manila for the week was 29,000 bales.*Hops*.—The market remains firm at last quotation, viz.: English £13, Californian £12, per cwt. There is a general and active demand.*Wheat*.—The market is quiet but firm.*Oats*.—The market is firm with an improved demand.*Beans*.—The market is firm owing to reduced supplies.*Peas*.—The market is slightly weaker with less demand; a large supply.*Cocksfoot-seed*.—The market is quiet. Buyers are not keen to do business in cocksfoot-seed.

London, 6th April, 1912.

Mutton.—The market is firm, at last quotations, viz.:—(Nominally) Canterbury, 4½d. per lb., North Island, 3½d. to 4½d. per lb.

Lamb.—The market is steady, and prices are well maintained.

Beef.—The market is quiet.

Butter.—The market is quiet, and prices are slightly weaker. The average price for the week for choicest New Zealand butter, per cwt., is 124s. Australian 120s., Siberian 120s., Danish 129s., Argentina 120s.

Cheese.—The market is steady. The average price for the week for finest New Zealand cheese, per cwt., is 74s.

Hemp. The market is very quiet, nothing doing. The output from Manila for the week was 26,000 bales.

Hops.—The market is firm, with an improved demand. For New Zealand hops the prospects are favourable for early shipments.

Wool.—The market remains firm.

FOOT-AND-MOUTH DISEASE IN BRITAIN.

THE High Commissioner forwards the following communication from the British Board of Agriculture and Fisheries: (1.) The existence of foot-and-mouth disease was last confirmed in this country—in Somerset—on the 8th December last. (2.) The disease was extirpated on the 11th December by the slaughter of all affected animals and of all animals which had been directly exposed to the risk of infection. (3.) All the precautionary measures which were adopted by the Board in connection with the outbreak were withdrawn by them on the 10th ultimo. (4.) There is now no reason to suspect that the disease any longer exists in any part of the United Kingdom.

AUSTRALIA AND AUSTRIA-HUNGARY STEAMSHIP SERVICE.

WHEN the announcement was made that a steamship line had been established between Austria-Hungary and Australasia, the High Commissioner in London communicated with the Hungarian Levant Steamship Company, which is said to be responsible for the service, asking for further information. The company replied to him to the effect that the service was established in an agreement with the Hungarian Government. According to the terms of this there will be eight outward sailings from Trieste and Fiume to the ports of Fremantle, Adelaide, Port Pirie, Melbourne, and Sydney. Cargo will be accepted for other Australian and New Zealand ports with transhipment. The sailings are to take place at regular intervals of six weeks. At present the boats will not be running to New Zealand ports, but should sufficient inducement offer the company will most probably consider the question of including New Zealand in the service.

The total exports from New South Wales for the year ending 31st December, 1911, were valued at £32,168,032. The principal destinations of the exports were: United Kingdom, £12,261,971; Germany, £4,443,245; France, £3,611,056; Belgium, £2,431,797; Ceylon, £1,895,535; New Zealand, £1,688,146; United States, £769,727; Japan, £666,887; India, £478,945; Hong Kong, £440,384; Fiji, £407,385; Chili, £359,316; Straits Settlements, £350,584; South Sea Islands, £276,033; Philippine Islands, £236,592; Java, £188,939; Natal, £165,191; Cape Colony, £150,639; New Caledonia, £136,850; China, £92,481; New Guinea, £91,254.



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WELLINGTON, N.Z.,
15TH MAY, 1912.

PRICE,
SIXPENCE.

RUAKURA FARM OF INSTRUCTION.

OFFICIALLY OPENED BY THE PRIME MINISTER.

THE AIM AND SCOPE OF THE INSTITUTION.

THE Prime Minister and Minister of Agriculture, the Hon. Thomas Mackenzie, officially opened on the 23rd of last month the first farm school of the Dominion, the Ruakura Farm of Instruction. Notwithstanding wet and disagreeable weather, there was a large and representative gathering of northern farmers at the ceremony.

In the course of his speech the Prime Minister outlined the farm-school scheme, which he has so much at heart, whereby a practical training may be provided under the best conditions for the son of the working farmer. He stated that in addition to the Ruakura Experimental Farm being converted into a farm of instruction, provision for

a practical training in agriculture was also to be made at Weraroa and Moumahaki Experimental Farms. Mr. Mackenzie said,—

“The dominant object of providing farm training at the experimental farms of the Dominion is that of making farmers, not the education of agricultural experts or of instructors: this can well remain the function of the Department of Education and of the University.

“It is accepted that rural education is of all questions the one that is in the foremost place in the minds of those who realize the importance of agriculture to the prosperity of the Dominion. This Department should, and can, supply the most important and practical assistance in this direction.

“The public schools are beginning to afford some teaching in rural subjects, and the technical schools afford training to those who are entering into commerce or handicrafts; but for the youth who is going on the farm there is no institution to which he can attach himself.

“The possibilities are so great that suitable accommodation is now provided for training young men in practical farming; but one of the experiences of having them at the station, and one that was very forcibly brought to notice, is that something more than working on a farm is essential: something to interest a young man is wanted. It can be readily seen that when the day's work is over youth must have something to interest it; there is a responsibility on the establishment that receives a young man, as well as a responsibility on the parents. To interest him there should be some useful teaching. To care for him he must be provided with comfortable quarters and good food, and he must be under some responsible person.

“It may be said that the proposals are ambitious. If they are so considered let the importance of agriculture—and it is simply all in all to New Zealand—be also considered. All our other industries combined cannot compare with agriculture in importance. The farmer may at least claim for his sons and daughters a modicum of the educational advantages offered to the sons of the miner, the mechanic, or the clerk. To meet this in a very modest way at Ruakura the building for the reception of young men is now in occupation.

“The first object for the reception of young men is the practical training in farming, and they are required to take the part of a farm hand in all work. They are under the absolute control of the Manager at all times, and after working-hours and in all matters connected with the house under his supervision. None may leave the farm except by permission of the Manager.

“The teaching, which must take an important part, will be courses of lectures and demonstrations on subjects connected with agriculture. These lectures will be associated with reading on these matters,

followed with an examination. To those who exhibit diligence some reward will be allowed, and to those who prove benefited by conduct and examination a diploma will be given.

"The courses of instruction, the demonstrations and the lectures, will be set out by certain officers of the Department, supplemented by others engaged for the purpose.

"It is not assumed that a detailed course of teaching can be set out here; it may, however, be somewhat on these lines:—

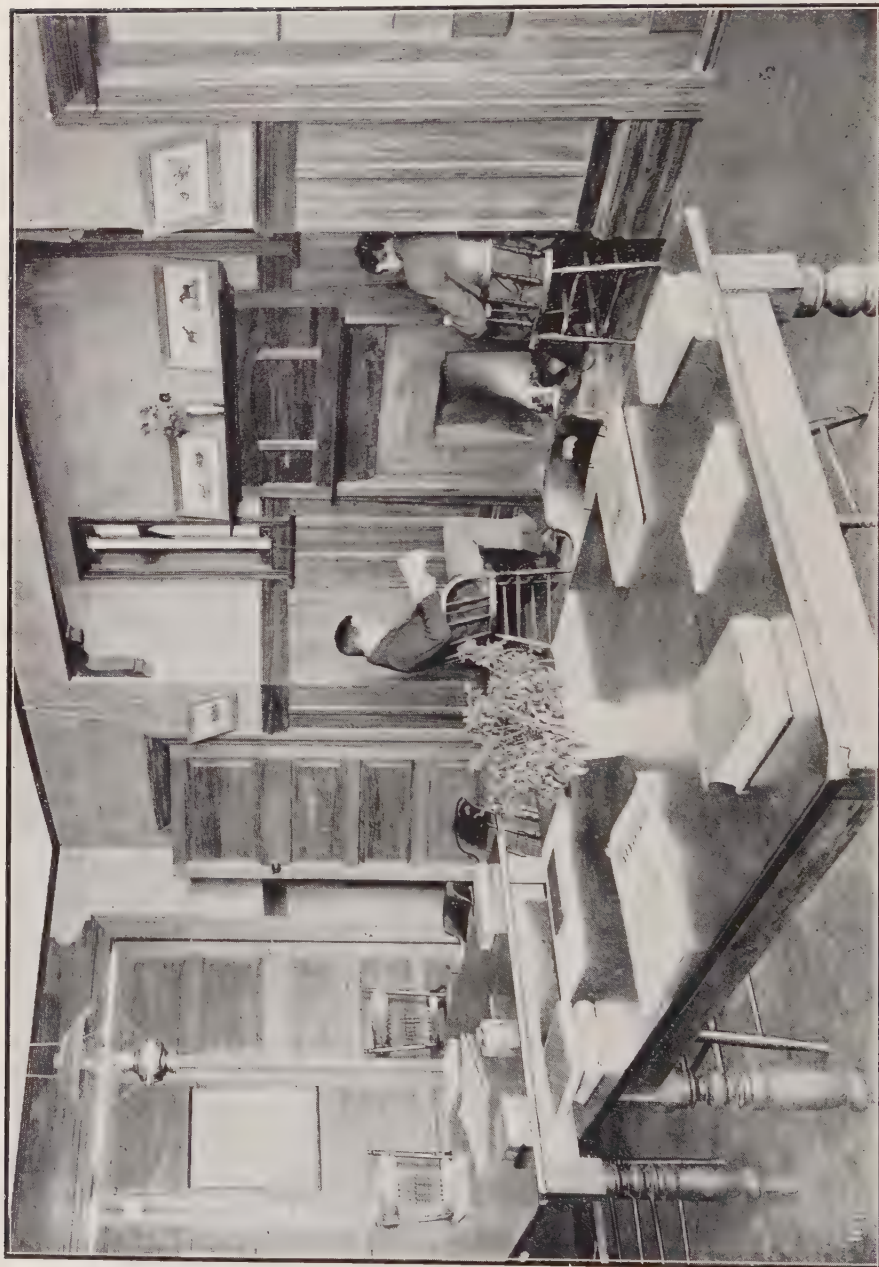
"It is not proposed to teach chemistry; but the fertilization of the land is all-important. A farmer should know the principal plant foods, the effect and the nature of the manures he applies. He should also understand how to appreciate the meaning of the analysis of fertilizers that accompanies the invoice supplied by the vendor. The Chemist associated with the Department will give a lecture each month and set out a course of reading that will enable this information to be appreciated.

"Farmers should interest themselves in this science, and some young men, if only shown how to introduce themselves to the knowledge of plants, would become enthusiastic, and to them, apart from interest, the appreciation of plants would be a valuable equipment in improved farming. The teaching in botany would enable the farmer to recognize more and more the value of rotation of crops; and this rotation is an immediate necessity on the farm. The recognition of harmful plants, such as those injurious to stock, those that affect the flavour of milk, and those that injure other plants, should be taught.

"The departmental officers attached to the Biological Branch will indicate a simple course of reading. In this subject the discrimination of grasses, their adaptability to certain conditions of soil and situation, and their conservation, are subjects of importance; so also is the knowledge of the diseases and pests to which all crops are liable. That farmers should be able to appreciate the structure, the nutrition, and the diseases of the domestic animals of the farm needs no plea. The farm stock of Ruakura are there for demonstration. The Veterinary officers have already given demonstrations at Ruakura to farmers and young men. Needless to say, these have been more than appreciated. The gentlemen attached to that division would welcome the opportunity of providing the necessary course of study to enable the young men to appreciate lectures and demonstrations.

"The staff of the Director of the Dairy-produce Division will also take their place in matters connected with the dairy, while on the farm itself instruction is given in regard to the correct method of taking milking records.

"Arrangements have been made to teach these young men to take levels of drains and roads, and to calculate correctly the quantities of



THE STUDENTS' SITTING-ROOM IN THE HOMESTEAD, RUAKURA FARM OF INSTRUCTION.



ANOTHER VIEW OF THE SITTING-ROOM, WHICH IS USED FOR THE LECTURES WHICH ARE A FEATURE OF THE INSTRUCTIONAL WORK.

earth in the excavation of drains, and road making and fillings. In connection with this many a young farmer is anxious to supplement the earnings of the land with contract work in road-making, and too many are deterred from this source of income merely because they are unable to estimate the cost of the work, for which, if they had this knowledge, they would gladly become competitors. Instruction in farm book-keeping will also be given. This should be an essential item, for few farmers know what is the result of any one division of their operations. The one main point, whether they are making money or losing it, is known, but where, or how, but seldom.

“The farm of to-day has become almost a machine-shop. Steam and internal-combustion engines are to be found everywhere. The harvester and drill are in common use, and with the dairy-farmer the milking-machine and the separator are in daily service at his farm. For this equipment a knowledge of the use and maintenance of machinery is desirable. Instruction from a machinery expert is being provided. The carpenter's shop will be another feature of the farm. The winter brings days when field-work is not possible. It is then that some instruction in the use of tools can be given.

“The orchard and garden are in evidence on the modern farm as sources of profit for home use and for sale. The horticulturist has already given instruction in grafting, pruning, and technicalities of these pursuits. The poultry establishment claims a considerable number of learners who intend taking up poultry-raising as an occupation. The apiary has proved itself of interest to a large number of young women who have thus had the opportunity of becoming completely equipped with the knowledge to enable them to successfully undertake the business of bee-farming.

THE CLASS OF LEARNER EXPECTED.

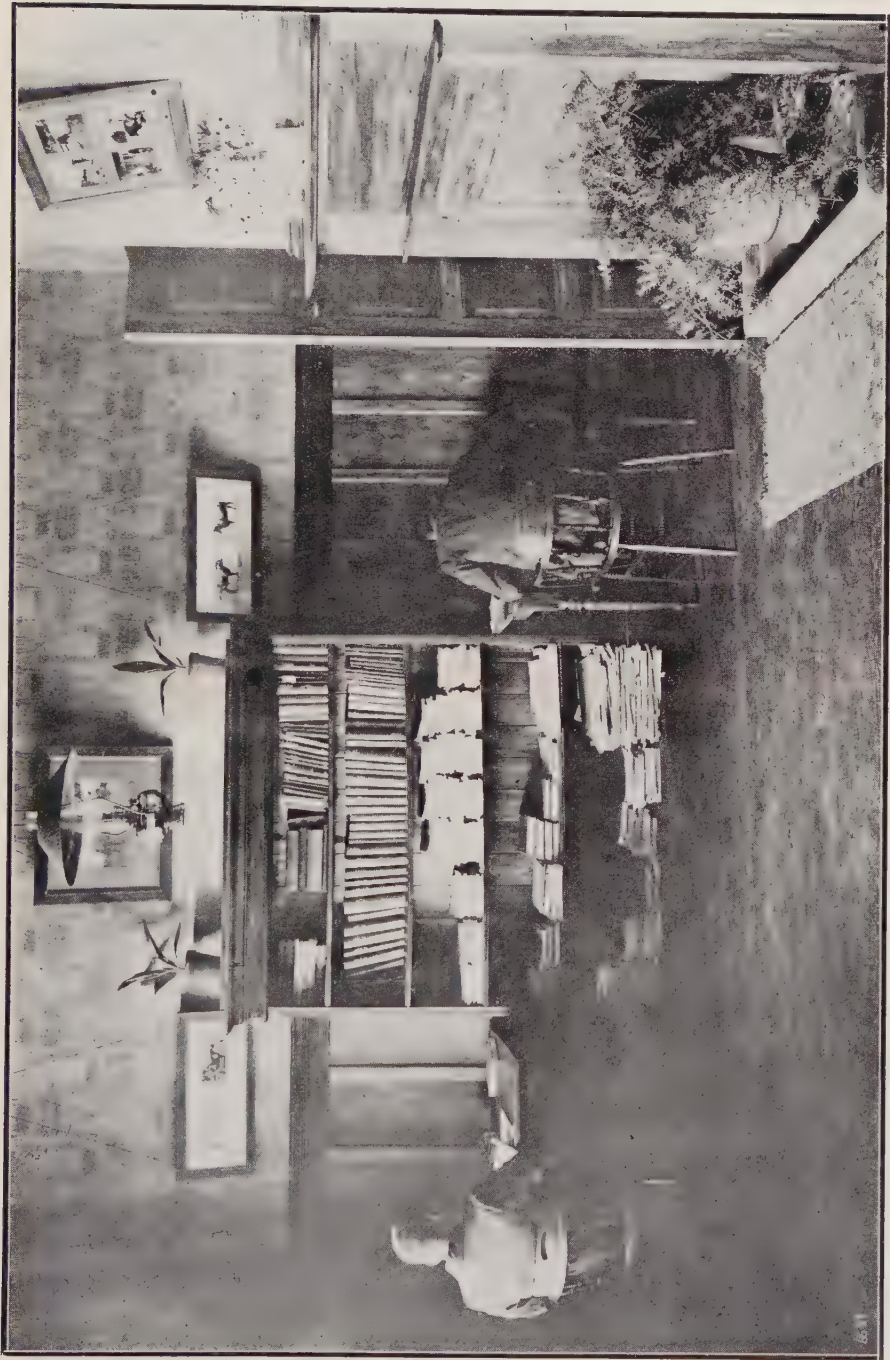
“There may be expected to come to the Ruakura Farm of Instruction young men of three classes, viz. :—

“1. The farmer's son. This will be the youth who has about left school, and who himself, together with his father, wishes to learn something more than the school provides.

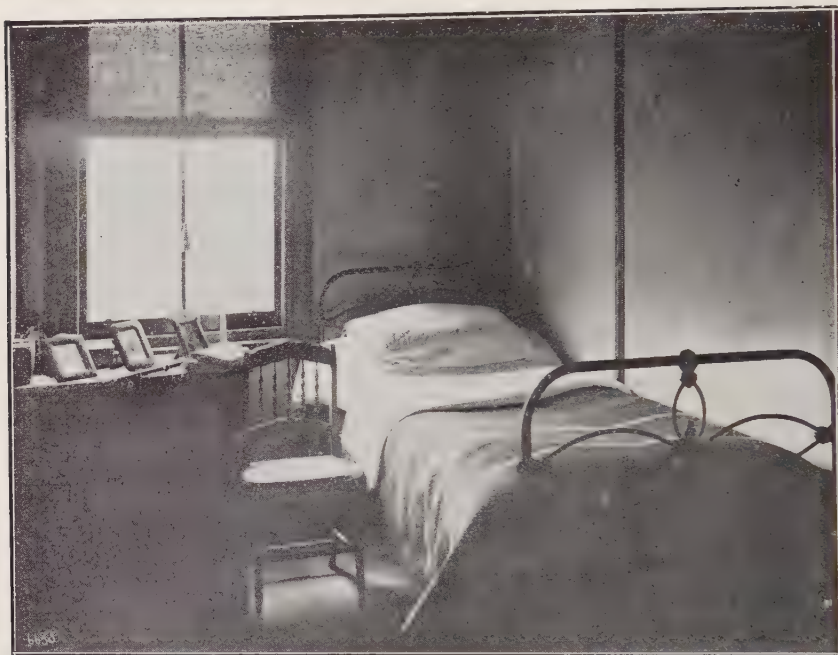
“2. Sons of professional and business men, whom their fathers propose to start on the land.

“3. Young men who arrive in New Zealand with the intention of taking up land, but who wish to obtain some experience in farming before doing so.

“The young man who comes to Ruakura enters into an agreement to remain a specified time. This term is a year. He also agrees to be under the complete control of the Manager, to conform to all



THE WRITING-ROOM AND LIBRARY.



A STUDENT'S BEDROOM.



A CORNER OF THE STUDENT'S LAVATORY AND THE BATHROOM.

regulations, and to take a full and active part in all work that may be required from him. He agrees to leave the farm on the notice of the Manager, who is not required to give a reason for that action.

"The ages at which candidates may be admitted are from fifteen to twenty, and they are subject to an inquiry as to character and general fitness before acceptance.

"The Minister of Agriculture, on the recommendation of the Director of Fields and Experimental Farms, decides and selects these pupils. The payment to pupils is 2s. 6d. per week during the first six months. If a pupil remains for a second year, this remuneration may be increased.

"It may be that a small premium will be required from the parents or guardian to ensure that the lad may not leave for trivial reasons. This would be retained by the Department if the lad did not remain one year, or if the Manager found it necessary or desirable to dismiss him for any cause whatsoever. If the lad behaved well, and remained a year, the sum would be at the disposal of the person, parent, or guardian.

"It is not proposed that fees should be charged, for the reason that if a young man was failing to earn the cost of his board and lodging, small wage, and cost of lectures, he would be required to leave the farm."



A STUDENT CULTIVATING A MILLET CROP.

CALIFORNIAN THISTLE.

A SUGGESTIVE FIELD FOR INVESTIGATION.

A. H. CROCKAYNE.

AMONGST the many noxious weeds that harass New Zealand agriculture Californian thistle* (*Cnicus arvensis*†) is generally ranked as the most widespread and most injurious. In many districts this thistle occupies immense areas of both agricultural and pastoral land, and in certain portions of both Islands it is so widespread that the adoption of any really efficient and practical methods of control at first sight appears well nigh impossible.

An almost incredible amount of work is annually undertaken by farmers in their efforts to subdue Californian thistle, and in districts where the patches are not too numerous or too large splendid results have been achieved. In other parts, however, the general prevalence of this pest, and the apparent impossibility of dealing with the whole of the thistles, has disheartened many farmers. In such localities, although a very large amount of work is carried out, it is done, in many instances, in order to avoid conflict with the law rather than in the belief that it is of any appreciable benefit in controlling the pest. So common is the idea that the present methods of dealing with Californian thistle are, in many instances, quite ineffectual that the abandonment of any control-work whatever has been frequently quite seriously suggested in many districts where the weed is especially prevalent. In order to condone this view it has been freely stated that Californian thistle is really of very little actual harm, and it is often endowed with valuable attributes with regard to feeding qualities that are certainly not substantiated in those localities where it can be efficiently controlled.

So serious has the thistle problem become that it is necessary to consider very carefully any suggested methods by which the labour at present involved can be reduced, and at the same time increased in efficiency. The problem must be squarely faced, and the suggestion of total abandonment of any control measures over certain areas should not be entertained until such time as it will have been definitely proved that no effective methods can be practically applied. In the present article I wish to call attention

* Californian thistle is a native of Europe, and is there known as field, creeping, or corn thistle. In New Zealand the name Canadian thistle is also often applied to the plant. Notwithstanding its name of Californian, that State is one of the few in the Union where it is altogether absent.

† Also called *Carduus arvensis* and *Cirsium arvense*.

to certain characteristics in the growth and development of Californian thistle, a full investigation of which may yield results that will lead to the formulating of an improvement in the methods for its control on permanent pasture land.

METHODS OF SPREAD.

The Californian thistle is a perennial with deeply penetrating underground stems, on which the true roots are developed. These underground stems, or root-stocks as they are often termed, spread more or less horizontally through the soil at a general depth of from 8 in. to 15 in., and give off at frequent intervals erect leafy shoots. These aerial branches die down in the winter, but fresh shoots are developed in the spring to take their place. The underground stems grow with great rapidity, especially in the first few years; and an individual plant may thus form an extensive patch more or less circular in outline in quite a short time. Clark has recorded a single seed producing a patch covering over 200 square feet within two years. Where the number of patches is small they may remain separated from one another for a number of years, but where the patches are numerous they soon coalesce and produce a continuous mass of thistles.

New patches arise either by seed or by pieces of the underground stem. The latter method usually occurs only on cultivated ground that has been ploughed *deeply*, thus cutting off and exposing portions of the underground stems. These may then be easily conveyed over the field in the ordinary processes of preparing the seed bed.

It is to seed, however, that the vast majority of new patches owe their origin. Such seed may either be produced from patches already established, or it may be unwittingly introduced through the medium of weed-infested grass or clover seed. This accidental sowing of thistle-seed is of more frequent occurrence than is generally supposed. In very many cases where thistle first appears in a new district it can be traced to the use of agricultural seed in which the pest was present. The use of impure oats and chaff is also a fruitful method of spreading this weed. Alsike, especially that of American origin, very frequently contains Californian thistle-seed. Indeed, so common an impurity is it in alsike that the very greatest care should be exercised when using this clover in a mixture. White clover and timothy also frequently contain small amounts of Californian thistle. *It has been noted that late crops are more likely to contain mature thistle-seed than those harvested early in the year.* The reason for this, of course, is that Californian thistle only matures seed late in the summer.* This feature should be certainly taken advantage of in

*The exact time of the year that the Californian thistle first produces mature seed should be carefully investigated for each district in the Dominion. In this way positive information would be secured, enabling farmers to determine accurately the latest date it would be safe to cut crops so that they would be free of any Californian thistle-seed. It may be found that the date mature seed is developed varies considerably in different years. Thus in early seasons the seed will mature earlier, but the same will also hold good for those crops in which the thistle is growing.



THE FEMALE PLANT : THE FLOWERING STAGES.



THE FEMALE PLANT: THE FLOWERING STAGE OVER AND THE SEED-HEADS APPROACHING MATURITY.

the growing of oat crops for chaffing in districts where the weed is prevalent.

There are numerous localities where Californian thistle has not yet established itself. In the North Island alone large areas are grassed yearly that contain no thistle. *If on such ground only pure seed is used the risk of invasion by Californian thistle will be very much lessened.* It must be remembered that a thick continuous sole of grass forms a great protective covering through which it is difficult for many weeds to establish themselves. This is well exemplified by the fact that bare unoccupied ground rapidly becomes covered with a weed flora which will be comparatively absent in adjoining land that is well grassed.

THE VALUE OF CUTTING.

I do not wish to deal with the general methods in vogue for the control of Californian thistle, as they are too well known to need any elaboration. The question of the actual value of cutting down the leafy and flowering stems in controlling and eradicating the weed is, however, worth some consideration. Very diverse opinions are held as to the value of cutting. Of course, if patches are continually kept cut down, and no portions of the plant are allowed to develop above ground, the plants must die as soon as the food-supply in the underground stems is exhausted. This method, which is the theoretical one for dealing with the thistle on pasture land, is obviously only practicable when the patches are small. When the patches are large it becomes an impossibility to cut down all the thistles more than once during the growing season. The primary object of such cutting must be to prevent any development of flowers, so as to eliminate all possibility of any seed being produced.

One of the great difficulties that arise is that when a very large extent of thistle is to be dealt with cutting has to be carried on over a long portion of the growing period. When thistles are cut very early new shoots are rapidly developed, and these, unless cut again, are liable to flower and mature seed. Again, when the cutting is delayed there is not sufficient time to enable all the thistles to be cut before some of them have matured their seeds. The actual value of a single cutting, apart from the prevention of seeding, is a very debatable point. It is probable that when the thistles are cut, and more light is thus let into the patches, grass is enabled to grow very much better than if they were left untouched. As the thistles completely die down during the winter, leaving the ground available for grass development, it might be found practicable in certain warm districts to take advantage of this by endeavouring to introduce into the patches some of those grasses that grow freely during the winter. Two grasses that immediately claim attention in this respect are prairie-grass and *Phalaris bulbosa*.

THE NOXIOUS WEEDS ACT.

With regard to Californian thistle, the Noxious Weeds Act makes it compulsory for every occupier of land to "clear" it at the proper season of the year. The definition of "clear" is to cut down, and keep cut down, or grub or pull up, the stem or root of any Californian thistle, to prevent any part thereof flowering. Now, the primary object of preventing a plant flowering is to eliminate any chance of any seed being produced. *Thus the fundamental principle underlying the Act so far as Californian thistle is concerned is to prevent it from seeding.*

The great trouble in giving practical effect to the Act with regard to Californian thistle is that in many localities it is almost impossible to properly fulfil its provisions. In certain districts the extent of thistles is so great that apart from the expense involved it is almost impossible to cut the whole of the thistles and thus totally prevent flowering. If a method could be devised whereby a diminution in the amount of cutting could be secured, and at the same time any seeding prevented, the administration of the Act would be greatly simplified. If this could be done more efficient work would be accomplished without undue hardship on the farmer.

THE PRODUCTION OF SEED.

It is frequently asserted that in a number of places Californian thistle never produces any fertile seeds*; and in certain cases this contention is undoubtedly correct. The Californian thistle differs from all other introduced thistles in producing male and female flowers on quite separate plants. To use the scientific term, Californian thistle is dioecious, whereas our other thistles are hermaphrodite, both the male and female organs being produced on the same flower. So far as I have seen in New Zealand the Californian thistle is always dioecious, although it has been stated that both sexes occasionally occur on the same plant. This assertion I am convinced is quite erroneous. The two sexes are absolutely distinct to the naked eye when in bud and flower, as can be clearly seen in the accompanying illustrations. The male flower-heads are subglobular, or almost globular, with the florets much expanded and asserted from the actual seed-head or involucre†, the top of each flower-head when in full bloom being often more than 1 in. across. The female heads are ovoid, or oblong, and the florets project only slightly beyond the top of the involucre, and are much shorter than in the male ones. Thus the actual flowers in the head are much smaller in the female than in the male. After flowering the male heads remain unaltered in size, and the florets gradually wither

* The "seeds" of thistles are in reality fruits, and are technically known as achenes, but the name "seed" has been retained for the sake of convenience in this article.

† An involucre is a series of modified leaves called bracts, closely placed round a flower-clustre, and arranged in one or several series.



THE MALE PLANT : THE FLOWERING STAGES.



MALE FLOWERS AT A LATER STAGE.

away without any appreciable pappus, or thistle-down, development. The female heads after flowering enlarge considerably, and as the pappus gradually increases it protrudes from the top of the heads, and gives them somewhat the appearance of paint-brushes. When the seed is ripe the heads open considerably, and the thistle-down, often with the seed attached, is carried away in the air by the wind. A careful investigation may lead to the discovery of characters that will enable the male and female plants to be distinguished before they have reached the stage of flower-bud development.

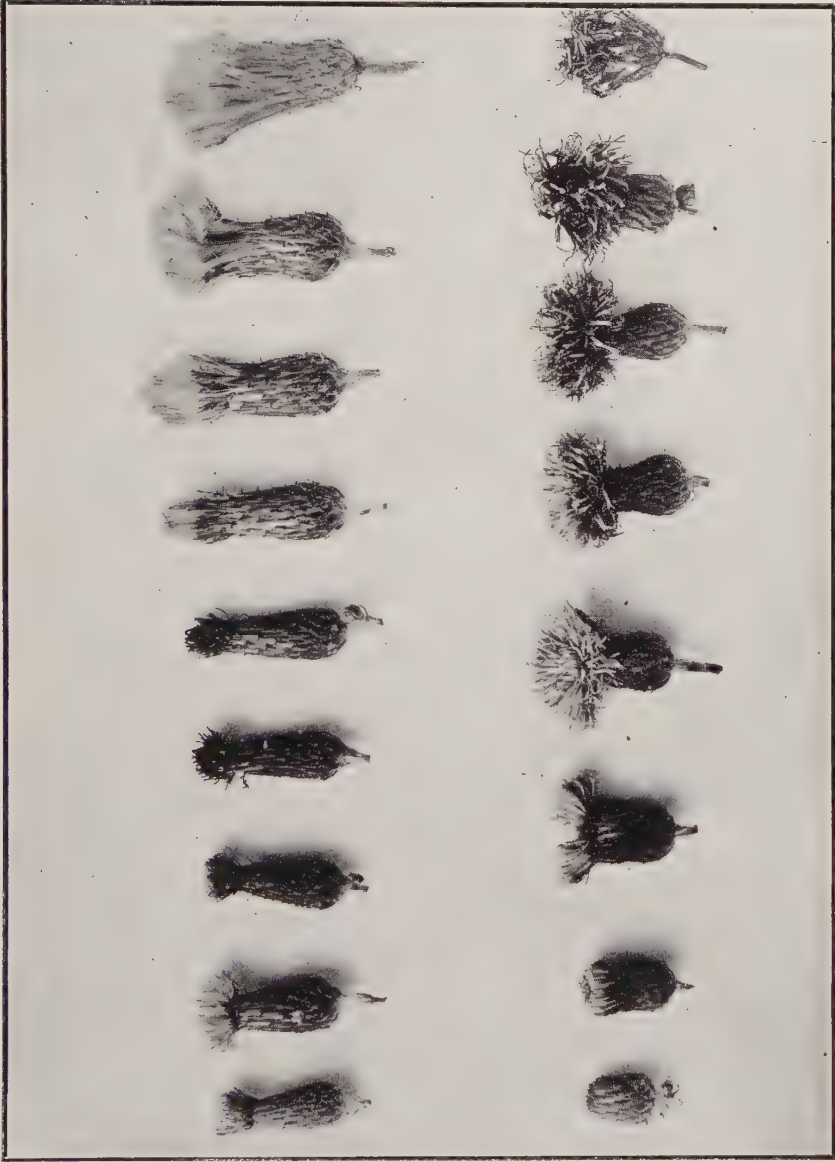
The diœcious character of Californian thistle is a matter of great importance. *The female flowers are alone capable of producing fertile seed.* Thus if all the female plants alone were cut down annually at the proper season the production of any seed would be totally eliminated. It has been shown that the prevention of seed-production is the essential feature underlying our Noxious Weeds Act, so that the spirit of the Act could really be completely carried out without cutting down any of the male plants.

THE RELATIVE ABUNDANCE OF MALE AND FEMALE PATCHES.

The practical value of any method of dealing with only one sex of Californian thistle will depend on the relative abundance of one sex over the other, and also to what extent the patches consist of both sexes mixed together.

In most cases the individual patches of Californian thistle, whether they coalesce or are widely separated from one another, owe their origin to a single seed. This single seed has in the first instance produced either a male or a female plant. For a long time past I have been struck with the fact that whenever I have examined Californian thistle there are present *large patches consisting of male plants.* During a recent visit to the Taihape district this fact was again brought very clearly under my notice. The sharp distinction between the male and female patches, consisting entirely of either male and female plants, was most marked. In certain instances patches were examined in which both sexes could be found, but even in these cases the different sexes were quite separate from one another within the individual patches themselves.

From the present limited observations I have made, pure male patches *appear to predominate.* On one farm of 400 acres the owner had noticed that the flowers on many of his thistle patches withered away after blossoming, and he was under the idea that they were diseased. He therefore had in certain cases not cut away any of these patches, and in every case they proved to consist of male plants only. The farmer in question considered that he had saved quite £15 in labour during the present year in not cutting these thistles. The work he had done was quite as efficient



HEADS OF THE THISTLE, IN THE ORDER OF THEIR STAGES OF DEVELOPMENT: TOP ROW, THE FEMALE; BOTTOM ROW, THE MALE.

in eliminating any seed-development as if he had prevented all the thistle on his farm from coming into flower. This example serves to show that a thorough examination of the relative abundance of male and female patches throughout the whole of our thistly regions, and the feasibility of cutting only those of one sex, is a matter of sufficient moment to warrant the most careful consideration. Such investigation might be the means of securing a method of more efficiently dealing with the seeding of thistles on pastoral land that would involve considerably less expenditure than is at present incurred. On investigation it may be found that in certain localities the two sexes are so intermixed in each patch that the whole of the thistles need to be cut, in order that seed-production may be prevented. On the other hand, it may be found that in many localities pure male patches predominate, and, so far as any seed-production is concerned, would not require to be dealt with. If such turned out to be the case, the female patches could not only be dealt with much more cheaply than at present but could be more efficiently cut at that period which would give the greatest check to the plants.

At present the Noxious Weeds Act compels the whole of the thistles to be cut before flowering, but if it were definitely proved that it is practicable to effectively cut only the female plants the Act could be amended to meet the changed requirements.

THE EFFECT OF WIND ON DISTRIBUTION OF SEED.

Another point of importance that requires to be thoroughly determined is the effect of wind on the distribution of thistle-seed.

The commonly accepted idea is that thistle-seed attached to the pappus, or thistle-down, can be blown very long distances by the wind. For my part, my observations and experiments, crude although they may have been, point very decidedly to the fact that the actual distance seeds may be blown has been very much overestimated. Mature seed capable of germination is attached very slightly indeed to the pappus or down, and the thistle-down being more easily moved by the wind than the actual seed it soon becomes detached, *especially during heavy winds*. On comparatively calm days the seed may remain attached for a considerably longer period than on windy ones. In fact, on windy dry days I have frequently noticed that much of the seed has fallen from the down almost before it has left the seed-heads. The thistle-down itself can, however, be wind-carried for very great distances, and at times seed that is not properly matured or fertilized, being attached in consequence more strongly, can be carried a long way before being separated from the down.*

* It may be found that animals and perhaps certain birds are more instrumental in conveying Californian thistle-seed long distances than is the wind. Floods may also play a fairly important part in certain cases.

The question of the distance seed can be carried is one that should be accurately ascertained. If it can be definitely proved that the power of dispersal is more limited than is at present supposed it may prove of great value in the devising of methods for dealing with certain areas where even a single annual cutting is yearly becoming more and more impracticable, owing to the very large extent of thistles. If the power of the dispersal of the seeds is shown to be more limited than is at present supposed such areas might be isolated from any surrounding clean country by cutting all the female plants before they flower for a definite distance round the whole of any area proposed to be isolated.

CONCLUSION.

The suggestions outlined in this article are to be taken as suggestions only, and not as definite statements of fact. I have endeavoured, however, to point out two lines for investigation that to me appear worthy of the fullest examination. If on investigation it can be conclusively shown that my contentions are correct they would certainly help in the formulation of more efficient and cheaper methods for the prevention of the seeding of Californian thistle than those that are now currently adopted. At the present time it is illegal to allow the flowering of any Californian thistle, but, nevertheless, large amounts of seed are annually produced on the thistle areas of the Dominion. It would thus appear that the present methods applied are not sufficiently practicable to fulfil the provisions of the Noxious Weeds Act; and the utility of any weed legislation is directly correlated with the degree of efficiency with which its provisions can be carried out in practice. If, on the other hand, my contentions are found to be fallacious no harm will be done. At the same time certain definite information on the characteristics of the growth and development of Californian thistle will be secured, and the more there is known about the habits of weeds the better is the equipment for fighting them.

The illustrations produced should prove useful in enabling any one to tell at a glance the difference between the male and female flower-heads. That the essential difference in the female only being capable of producing seed is not generally recognized has been very forcibly brought under my notice lately. I have required a large amount of Californian thistle-seed for certain special purposes, and four out of every five of my correspondents sent me male heads, incapable of producing any seed whatsoever.

The seed from selected Superlative swedes grown at Moumahaki Experimental Farm in the 1909-10 season is giving good results at the Ruakura Farm of Instruction this year. This selected swede is of fine conformation, not too thick in the neck, and is a well-formed root of excellent texture.



ABERDEEN ANGUS BULL PREMIER OF DALMENY.

Bred by the Earl of Rosebery; imported by Mr. W. J. Birch, of Thorsby, Marton.

THE BEEF TRADE.

THE SECOND-QUALITY ARTICLE.

C. J. REAKES, D. V. Sc., M. R. C. V. S.

It is now several years since an export trade in boned beef was initiated in this country, in response to an increased demand for this article in Scotland and the North of England. For the purposes of this business animals were utilized which were in point of quality considerably inferior to those slaughtered for the ordinary beef export trade, which compare favourably with those exported to Great Britain from other countries. The so-called "boners" were principally cows, which for various reasons had become unprofitable for milking purposes, and bulls. The meat was removed from the bones, cut into portions of varying size, packed in boxes, and frozen. This business proved payable, and as this meat, as in the case of all meat exported from New Zealand, was from cattle slaughtered under inspection, it was free from disease, and from this point of view a safe article of food, though its appearance after its removal from the boxes and subsequent defrostation was not always attractive. In view of the importance of the meat export trade to this country, and the paramount necessity for maintaining the high reputation of New Zealand meat on British markets, however, the question of the development of this section of the meat industry gave rise to some discussion, and it was realized that, though profitable to the exporter, it possessed elements of danger to the reputation of our meat as a whole which caused it to be viewed with marked disfavour by those who had the welfare of the pastoral community at heart. At the same time, it was not an illegal trade, and those engaged in it were always willing to accept the decisions of inspecting officers in dealing with the animals slaughtered. This particular phase of the business, however, was brought abruptly to an end by the regulations made by the British Government in 1909, which had the effect of practically prohibiting the importation into Great Britain of meat from any country boned and packed in the manner described. These regulations were not aimed particularly at New Zealand boned beef, which only formed a very small proportion of the whole imported.

Still a strong demand existed for inferior beef of this class, and after various experimental shipments had been made the business has

now settled into the exportation of this class of beef in two forms—first, the carcase quartered and frozen in a manner similar to that adopted for prime beef; and second, the whole of the flesh removed from the bony skeleton usually in six portions only, each portion being easily identifiable, and with the lymphatic glands left attached in their normal positions. These portions are frozen before packing, so that inspecting officers in Great Britain can examine them, as desired, without difficulty while still in the frozen state.

So long as animals of sufficiently good quality only are utilized, no serious objection can be taken to this business, since it provides farmers with a good market for a class of stock which otherwise would be difficult to dispose of, consequent upon the comparative smallness of our population and the critical attitude of meat consumers here on the point of the quality of the beef supplied to them. It is thus possible to cater in some degree for the strong demand for beef of this kind in some parts of the Old Country. But, unless properly conducted, this business has in it marked elements of danger to our greater and most valuable export trade in prime meat; and in order to adequately safeguard this trade, and in so doing to protect the interests not only of producers but of the community at large, it is essential that it be properly regulated, and every care taken that no meat which is not right in every way shall be allowed to leave this country. It is a question of quality alone. Disease is effectively dealt with under our thorough and comprehensive system of meat-inspection, which ensures that nothing but healthy meat is passed for human consumption. But it must be realized that carcasses below a certain standard of quality, even if perfectly healthy in the sense of being free from disease, are likely to present a most uninviting and unpleasant appearance after having been subjected to the processes of freezing and defrostation. So objectionable is the appearance and the character of the meat in such cases that it is rightly looked upon as being an unfit article of food, and is, in consequence, condemned by the British Inspectors. Often such carcasses, when cooled after slaughter, will, as a result of the natural process known as *rigor mortis*, “set” fairly well, and, though lean, will not appear otherwise open to objection; but when thawed out after freezing the meat will not again “set” firmly and evenly unless there be sufficient fat in the tissues to produce this condition, but instead will remain flabby and watery in appearance, often discoloured, and be in such a condition as to be repugnant to the eye, and unwholesome as an article of food, besides being liable to quick degenerative changes. To adopt the practice of allowing such meat to go into the Home markets would be quite unwarrantable when the risk which would be involved to the reputation of our valuable meat export trade by such a practice is considered, and, consequently, all

Meat Inspectors are instructed to exercise a rigid supervision in the matter of the quality of carcasses examined, as well as in the matter of disease.

New Zealand meat now has a high reputation, and the necessity for the maintenance of this reputation must override all other considerations. This export trade in second-class beef is only a minor item in the whole, and, while being a perfectly proper and legitimate business when conducted on right lines, it is essential that no effort be spared to keep it within those lines in order that one of our greatest industries may be adequately protected.

MANURE PACKAGES.

THE complaint made by the Waterside Workers' Union as to the nature of the bags in which artificial manure is packed, and its demand that the bags be paper-lined, has created a good deal of discussion at meetings of agricultural societies and by various branches of the Farmers' Union. Importers of manures who have gone thoroughly into the matter have estimated that the extra cost of paper-lining the bags would amount to about 5s. per ton. This, of course, agents and importers would have to pass on to the farmer. The farmer, therefore, would have to bear the whole cost of meeting the requirements of the waterside workers. Apart from this, there would be a distinct disadvantage in the adoption of the paper lining to the users of the manure. Manufacturers have been improving the condition of chemical manures by making them more free of lumps, as well as more pliable and quickly running, so as to permit not only of their effective solubility but of being readily sown through any kind of drill. With paper-lined bags trouble would be bound to ensue, for in the ordinary course of handling the paper would become torn, and in emptying the manure into the drill small pieces of the paper would be bound to find their way into the machine and finally into the spouts, blocking these, and thus preventing the manure being sown freely and evenly. The serious drawback of this may be at once realized, for one has only to glance at a crop of any description where the manure-feed in the drill has not been working well to appreciate the difference between even sowing and any irregularity in the work.

The most feasible solution of the trouble would appear to be the providing of bags of a superior quality, so that the nuisance caused to those handling manure cargoes—and it is a nuisance—may be thereby somewhat abated.



THE MAIZE ON THE CO-OPERATIVE EXPERIMENTAL PLOTS AT BELFAST, CANTERBURY.

ESTABLISHING LUCERNE.

EXPERIENCE AT RUAKURA FARM OF INSTRUCTION.

PRIMROSE McCONNELL.

AN attempt has been made at Ruakura Farm of Instruction this season to grow lucerne on a practical scale. It will be admitted that the Ruakura soil cannot be considered suitable for the growing of this crop, and the paddock chosen for the experiment is one of the most unlikely on the whole station. This paddock has been drained to some extent, but not sufficiently, and on portions of it the water stands during wet weather. The previous season half of the paddock was in potatoes and half in rape and kale.

As late as the middle of August I had not decided to attempt lucerne this season, as no suitable paddock was available; but I came to the conclusion ultimately that an attempt to grow it on an unsuitable paddock might provide some valuable experience, even if the experiment were a failure. The hope of success was decreased, not only by unsuitable and wet soil, and cold, wet weather, but also by the want of proper preparatory cultivation. The latter should, in my opinion, commence at least a year beforehand.

The paddock in question (9 acres in extent) was ploughed in June to a depth of 6 in. In August it was twice double-disced, cultivated 9 in. deep, and tine-harrowed. In September it was again tine-harrowed. In October it was cultivated, tine-harrowed, disced, and tine-harrowed. On the 2nd November it was Cambridge-rolled; and on the 3rd November the seed was sown broadcast at the rate of 15 lb. per acre, and covered in with the chain harrow. It was my intention to give it a further roll, but wet weather set in and prevented this.

One mistake in the sowing was made very clear. The chain harrow was too heavy for covering purposes, as the soil, being in fine tilth, drove in front and covered some of the seed too deeply; and I believe that many instances of failure, even on good soils, may be traced to this mistake. On portions of the headland, where there was practically no loose soil and the seed to a great extent uncovered, the germination was splendid, the plants being too numerous if anything. However, over the whole paddock, quite sufficient seeds germinated to make a good stand.

The manures applied were as follows: 24th August—9 cwt. of carbonate of lime per acre; 30th August—4 cwt. of Malden Island guano

per acre; 15th September—28 lb. of sulphate of potash per acre; 2nd October—3 cwt. of inoculating soil per acre; 24th October—4 cwt. of basic slag per acre; 3rd November—3 cwt. of superphosphate per acre, sown with the seed. This may seem an exceedingly expensive manuring; but it must be remembered that the paddock was in poor condition naturally, and there had been no preparatory cultivation in the way of crops that would leave a manurial residue on which the plants could thrive. It must also be remembered that a successful stand of lucerne, even at such a cost, would yield a big profit in the years to come.

The whole paddock received the dressings of guano, slag, superphosphate, and sulphate of potash; but in the case of the lime and the inoculating soil three check plots were reserved. One was neither limed nor inoculated; one received lime and no inoculation; and the other was inoculated but received no lime.

On the 4th January the lucerne was cut over and allowed to lie as a mulch. It was again cut over on the 27th January and made into hay, also on the 22nd February, this cutting being done more with the object of keeping down weeds than securing hay, and cut for the last time on 20th March. The crops obtained were, of course, light, the period of growth being for the second cutting twenty-seven days, for the third cutting twenty-six days, and for the fourth cutting twenty-eight days.

At the date of writing, the 28th March, the plants in the main portion of the paddock, which received both lime and inoculation, look very healthy, and, although the wet spots are overrun with "redshank" (*Polygonum persicaria*), the whole result is very encouraging, and beyond expectations.

The plot which was neither limed nor inoculated, and that which was not inoculated but received lime, are now in a bad way—the plants looking yellow and sickly; while the plot which received no lime but was inoculated, though looking better than the two former, is not quite so healthy as the main plot, which received both inoculation and lime. The result is a decided proof of the advantage of applying soil from an established lucerne-plot.

A small plot has also been established in the poultry section with the object of supplying green food for the poultry. Great trouble was taken with this plot, both before and after sowing, with the result that it is one of the healthiest plots of lucerne I have ever seen, and, although sown as late as the middle of December, it has already yielded a large quantity of green feed, of which the poultry are very fond.

In the nursery division of this station nine varieties of lucerne are now under test, and at present they stand in the following descending order of merit: (1) Hunter River; (2) Peruvian (from seed grown on the farm); (3) Colonial; (4) French; (5) American; (6) Arabian; (7) Peruvian (imported); (8) Turkestan; (9) Hungarian.

I may state that the result of the nitrate-of-soda treatment in Scotland is similar to that already obtained in France. In New Zealand, however, I do not anticipate any beneficial results from dressings of this fertilizer, as, generally speaking, the New Zealand soils seem to contain sufficient nitrogen. At any rate, I have not been able, so far, to apply nitrogenous dressings to any crop with an appreciable profit.

It is rather strange that at such an institution as the Glasgow College no attempt was made to note the effects of a dressing of lime, as this is now acknowledged to be essential for the successful cultivation of lucerne.

The remarkable increase in 1909 in the yield of the untreated plot is not easily explained, although it may be put down as the result of the dressing of phosphate and potash; and yet the result of many experiments would seem to prove that it is only the initial manurings that have much effect, and no doubt there must be some truth in this, as the further the long tap-root goes down it must render the plant less dependent on surface feeding. It will be noticed that the inoculated plot gave an increased yield each year, while the yield from the nitrate treatment fluctuates somewhat. After the above experiments were concluded, a cubic yard of the inoculated plot was dug up, and the lucerne-roots washed free from soil and weighed. It was then found that the quantity of roots left in the soil amounted to 9 tons 11 $\frac{3}{4}$ cwt. per acre; and the report contains the following statement, which is surely worthy of note: "The fact that a crop of lucerne, slightly manured, left at the end of five years nearly 10 tons of highly nitrogenous roots to decay in the upper 3 ft. of the soil and subsoil shows how exceedingly valuable this crop is, both as a means of opening up the soil and subsoil, and also of enriching it in nitrogen available for further crops." The report, perhaps, might have added that the above results are being obtained in spite of the fact that several heavy crops are being reaped yearly.

Summarizing on the experience of lucerne-growers both at Home and abroad, the following rules may be safely advocated as being essential to the successful establishment of this plant:—

- (1.) The soil should be naturally dry, or sufficiently drained, so that no water stands on the surface any length of time.
- (2.) The land should be thoroughly and repeatedly worked, so as to aerate it and destroy weeds.
- (3.) Pure and sound seed should be used, and care taken not to cover it too deeply.
- (4.) Where inoculated soil is obtainable it should be applied at the rate of 2 cwt. to 3 cwt. per acre, and worked into the soil at once.
- (5.) Lime should also be applied, if unburnt, at the rate of 20 cwt. per acre; and, if burnt, at the rate of 10 cwt. per acre.

- (6.) If weeds appear to any extent the first season the ^{only} remedy is repeated cutting, but not too close. Repeated harrowings will also stimulate the growth and destroy some of the weeds.
- (7.) The manures applied should be principally phosphatic, with a little potash on light soil.

Finally, no reasonable expenditure of time or money should be spared in the preparatory cultivation for this crop, and if a leguminous crop is grown for ploughing under prior to sowing the lucerne the chance of success will be still further ensured.

CUTTING LUCERNE.

A CORRESPONDENT has directed attention to an article appearing in "Hoard's Dairyman," in which it is stated that the repeated cutting of lucerne in the first season is a mistake, and asks if this is borne out by New Zealand experience. So far as the knowledge gained of lucerne at Ruakura and Moumahaki Farms, it would certainly seem that in this country the repeated cutting has a beneficial effect. Of course, the plant must not be cut too short. A height of about 3 in. should be left so that the crown may not be injured. This when the crop is about a foot in height. Where the growth is not too thick, allowing this first cutting to lie on the ground as a mulch has proved the most successful method of developing a good stand. In this first cutting the swath-board should be removed from the machine, so that the cutting may lie uniformly over the field. The light mulch prevents weeds from seeding and shields the young lucerne plants from the weather, thereby giving it an opportunity to make a vigorous and unimpeded growth. Most successful lucerne fields have been established at the farms in question under this system followed by several periodic cuttings in the first year.

Several thousand dollars are offered in prizes for 10-acre fields of alfalfa of at least two years' standing in the Province of Saskatchewan, Canada. This competition is carried on under the auspices of the Saskatchewan University. The railways, the farm Press, and the Provincial Government are co-operating in the movement.—*Spokesman Review*.

One of the many instances of appreciation expressed of the Ruakura Farm of Instruction by visitors was that of a Wairarapa farmer who went to Ruakura last month to see what was being done in connection with lucerne cultivation. He declared that what he had seen in this connection had more than justified the time and money spent on his investigation.



CHOU MOELLIER ON THE CO-OPERATIVE EXPERIMENTAL PLOTS, BELFAST, CANTERBURY.

THE FARM DOG.

NOTES ON SOME COMMON AILMENTS AND THEIR TREATMENT.

H. A. REID, F.R.C.V.S., D.V.H.

MUCH has been written, and much good advice given, to farmers and agriculturists regarding measures for the prevention and cure of disease among stock; but it is rare to find, except in such journals which devote a portion of their columns to "Kennel Notes," any reference to the dog, that "faithful friend of man," without which sheep and even cattle farming in this country would be a matter of practical impossibility. The writer has often felt surprised that sheep and cattle dogs, which render such material assistance to their masters, and whose value in hard cash in some cases is considerable, should, for the most part, receive such little consideration as regards their general health and condition. A sick dog that cannot work is very often entirely neglected, his chances of recovery depending largely upon his own bodily resources, unsupported by the intelligent care of his owner. Rarely do shepherds devote any proper attention to the health of their dogs, upon whom so much depends; and occasionally when something is done to alleviate the all too obvious sufferings, the remedies are applied too late, or, through the employment of wrong methods, the animal's end is hastened or recovery retarded. It is with thoughts of many a good dog lost through want of definite knowledge regarding the symptoms and treatment of some of the more frequently encountered ailments and injuries that the following notes are penned.

DISTEMPER.

Among the diseases to which dogs, particularly puppies and young animals, are liable, distemper occupies a foremost place. The number of dogs lost annually in New Zealand from this trouble alone must be very considerable, and among these there is not the slightest doubt but that many could have been saved had the necessary care and attention been bestowed upon them. It is not my intention to enter upon a complete account of this, or any disease in particular, within the limits of this article, but a certain amount of attention must be devoted to a brief description of the complaint. To the average individual the symptoms of distemper are best likened to a severe cold. It is, in fact, an infectious catarrhal fever, due to the entrance into the system of a specific organism.

Young animals are more susceptible to infection than older ones, but distemper may occur at any age. Like all contagious diseases, it arises from direct or indirect communication with an animal suffering from the disease, or recently recovered from it, or which may be incubating the trouble without as yet having shown manifest signs of being ill. The nasal discharges and excretions from dogs affected with distemper are infectious, and the disease may thus be conveyed by contamination or direct contact with such infective matter. In the earliest stages there is slight nasal discharge, accompanied by marked depression. Soon the discharge, which has been of a watery consistency, becomes thick and purulent, the eyes become inflamed, and also exude matter, which tends to glue the lids together; a rash sometimes appears on the skin, the appetite fails, the bowels are costive. The animal lies about, shivers, and rapidly becomes a picture of misery. Often the earliest noticeable symptom will be the skin-eruption, commencing as a rash, attacking the inside of the thighs and hairless parts, and developing later into a pustular condition, which gives rise to a considerable amount of irritation and discomfort.

Unless properly treated in the early stages complications quickly follow. These affect as a general rule the bowels, lungs, liver, and finally the nervous system. In the case of the first mentioned, diarrhoea may supervene upon the previous constipated condition, the intestine becoming inflamed, and dysentery (discharge of blood) may set in. When the lungs are attacked the symptoms manifest themselves by a harsh cough, accompanied by irregular breathing, which may also be very painful. In the case of the liver being affected acute jaundice appears, signalized by the membrane inside the eyelids and the skin of the inside of the thighs and other hairless parts becoming a well-marked yellow colour. The specific germs of distemper when well established elaborate a toxin (poison) which, when it acts upon the nervous system, causes twitching movements (St. Vitus's Dance) to make their appearance, these being often followed ultimately by partial or complete paralysis of the hind quarters. A combination in a greater or lesser degree of these symptoms may occur at the same time, though, speaking generally, each animal affected will usually show some one or other of the different forms mentioned, depending no doubt on the individual susceptibility of the various organs attacked.

Treatment.—In no other disease of the dog does recovery depend so much upon careful nursing as distemper. Unless the patient is made comfortable and treated with proper regard to cleanliness of itself and its surroundings during an attack, the administration of medicaments in this disease is useless, and no time need therefore be wasted in giving drugs. As soon as any of the symptoms enumerated are observed the dog should be isolated from its fellows, provided with plenty of good straw or hay bedding to lie upon, in a comfortable dry place free from draughts, but with plenty of fresh air available. In fine warm weather open air

and sunlight are most desirable, but special care should be taken to protect the sick dog from cold, wet, conditions. In the earliest stages a dose of castor-oil (1-3 tablespoonsful, depending on age and size of the animal) should be given, shaken up in about double the quantity of warm milk. When the catarrhal symptoms make their appearance the eyes and nostrils should be kept free from accumulated discharge by occasional sponging with clean warm water containing a little boracic acid. If the dog appears cold, and shivers, a jacket made out of an old flannel-blanket, fitted on to the back like a horse-cover, will be found of much benefit. Plenty of fresh cold drinking-water, which must be frequently changed, the receptacle being cleaned at the same time, should always be within reach throughout the illness. Lightly boiled lean meat, cut into convenient pieces, is the best and most suitable diet, and the most appreciated. Cooked liver or paunch are excellent for relieving constipation. Warm milk should also be offered any dog which, through swelling and pain in the region of the throat and the fever accompanying the disease, may very early in the sickness refuse all solid food. In bad cases in which the appetite completely fails, warm milk, beef-tea, good soup, or beaten-up eggs, must be given out of a bottle five or six times a day. There is no specific medicinal remedy for distemper, and the most necessary point in treatment is to take every care to foster the animal's strength as far as possible, and thus aid its natural resistant powers in their efforts to fight the disease. Attention must, however, be paid to the state of the bowels, any tendency to constipation being combatted by moderate doses of castor-oil, or Epsom-salts ($\frac{1}{2}$ -1 tablespoonful in $\frac{1}{4}$ pint warm water) and laxative diet. Either Dover's powder (5-15 grains), quinine (2-5 grains), or antipyrine (10-15 grains), given three times a day, are also recommended as suitable medicines during the early acute period of the attack. Should the liver become affected, and jaundice supervene, these medicines are unsuitable, and instead calomel in 2-4 grain doses should be given. The skin-eruption, when present, should be treated by the application of a dry dressing composed of boracic acid, 1 part; starch powder, 10 parts. This should be lightly dusted over the affected areas. Disinfection plays an important part both in the prevention and treatment of distemper. The kennel or sleeping-place should be washed down with a solution of Jeye's fluid, or sheep-dip, and the surroundings of the ailing animal thoroughly cleansed and disinfected from time to time. Should the dog die, the body should be burned for preference, or at any rate buried without delay. No reliance whatever can be placed in so-called vaccines, either as preventive or curative agents in this disease. Signs of recovery will be seen in returning animation and appetite, while the dog will take a more intelligent interest in the objects around it. Unfavourable signs are acute and blood-stained diarrhoea, difficulty and pain in breathing or when being handled about the region of the chest, and twitching of the muscles of the

legs, indicating that the nervous system is involved. As a rule, the dog becomes extremely reduced in condition, and suffers from exhaustion, verging in some cases on collapse; but hope must never be given up. Careful nursing and constant attention will often, even in the worst cases, pull the patient through. It should be borne in mind that after recovery the animal will be still very weak. No work should therefore be given until he appears thoroughly strong again, and then great care should be exercised not to overtax the strength of a willing but debilitated dog.

WORMS.

Dogs of all ages are particularly liable to be infested with worms, owing to their carnivorous nature impelling them to eat raw flesh and offal which may harbour these parasites in the immature or cystic stage. Several varieties of tapeworm find their normal habitat in the intestine of the dog, where they live by absorbing nourishment from the bowel at the expense of their host, thus reducing his condition, and by irritating the bowel giving rise to nervous affections often accompanied by fits. The dog badly infested with worms usually appears out of condition, the coat is dull and harsh, the appetite capricious, and temper uncertain. Puppies are especially prone to infestation by a tapeworm (*Dipylidium caninum*) whose immature stage is passed in the dog-louse or dog-flea, and is thus readily transferred to the inside of the young dog, where it undergoes development into the mature tapeworm. Another common tapeworm (*Taenia coenurus*) passes its cystic form in the brain of sheep. Hares and rabbits frequently harbour in cystic form a tapeworm of the dog, *Taenia serrata*. Lambs, again, may have in their abdominal cavities an immature worm of which the dog becomes the ultimate host—*Taenia marginata*. This is the largest tapeworm found in the dog. In contradistinction to the last named, the dog is also the host of the smallest known tapeworm—and the only dangerous one so far as human beings are concerned—the *Taenia echinococcus*. The cystic stage of this worm is passed in various organs and situations in the body of different species of animals, chiefly cattle and sheep, and also man. It gives rise to the complaint, serious in man, commonly known as hydatid disease, which is of frequent occurrence in this and other countries largely devoted to sheep and cattle raising. In the dog the worm is of such small dimensions as to easily escape observation. The whole worm, composed of three or four segments, measures less than a quarter of an inch in length. Segments of the worm containing the eggs are voided by the dog on to pastures, whence the latter are taken in by grazing sheep or cattle. The eggs may also be conveyed by rivers and watercourses on to different edible vegetation, such as watercress and other articles used in salads, or may be deposited by the dog direct in the vegetable-garden. By drinking

water containing the eggs or eating uncooked contaminated vegetables man may become infected, with the most serious consequences to health. For this reason alone it should be the duty of every shepherd to see that his dogs receive from time to time at regular intervals some medicine to expel worms. No matter to what species they belong, treatment for worms is on practically the same lines in each case. A dog suspected of harbouring these parasites should be starved for twenty-four hours, and then in the morning a vermifuge should be administered. For tapeworms one of the best remedies consists of powdered areca-nut (2 grains per pound body-weight; average dose for larger breeds, 1 dram), santonine 3-10 grains, thoroughly mixed with four tablespoonsful of warm milk, and given freshly prepared. Another very convenient and efficacious preparation is that known as tenaline: dose, 20-120 drops. Immediately after being dosed the dog should be allowed to run in a confined space, when often in less than half an hour the worms will be expelled. After their discharge the worms and excreta should invariably be collected and burned. If the medicine fails to effect its object within a reasonable period a dose of castor-oil may be given to accelerate its action.

While on the subject of parasites it is appropriate to remark upon the importance of keeping dogs in as cleanly a condition as circumstances will permit. Dogs, as a rule, are all more or less infested with fleas, but the degree to which this goes sometimes becomes intolerable. To keep a sheep-dog in proper condition so that he may satisfactorily perform the hard work expected of him he must have adequate rest. This to the badly flea-stricken animal is impossible to obtain. His leisure time is spent in the vain pursuit of chasing the irritating vermin from place to place on his body. It is pitiable to see the intense discomfort sometimes occasioned by the presence of fleas. Incessant biting, scratching, and whining follow the repeated attacks of these agile enemies. Not only fleas but lice also are very prevalent in sheep-dogs, and give rise to a large amount of discomfort. To free the animal from these troublesome pests is not difficult, but as this entails some amount of time and trouble it is unfortunately seldom attempted. A good wash with soft-soap in warm water containing a fairly strong solution of Jeye's fluid or non-poisonous dip is generally all that is necessary. This should be repeated at intervals, and the kennels or sleeping-places washed out with boiling water. A good dressing with Keating's insect powder will also prove of value in destroying fleas. Kennels coated over with tar are less liable to harbour fleas than those made simply of undressed or painted wood. The role of the flea in the production of tapeworm has already been alluded to, and it seems probable that as scientific investigation advances, some other diseases whose exact mode of origin appears at present obscure, will be found to be conveyed by fleas or other variety of skin parasite.

(To be continued.)

PUMICE SOILS.*

B. C. ASTON, F.I.C.

PUMICE soils are classified as coarse sands, but the word "sand" conveys rather a wrong impression, sandy soils usually consisting of a large proportion of silica in the free state (quartz), a substance incapable of yielding the necessary food for plants. Pumice contains a less amount of silica (which is in the combined state) and a larger amount of plant food than the majority of sands.

The pumice sands of the North Island central volcanic plateau are an example of a soil which has undergone the least possible alteration from the original eruptive rock from which it was derived. Usually soils are formed by the weathering and disintegration of rocks and by the action of moving water in transporting, grinding, hydrating, and sorting out the rock particles. Some of the more soluble constituents of the original rock are dissolved out and lost; other constituents are oxidized or hydrated, so that the resultant soil possesses characters widely different from the parent rock. On the other hand, although of the same chemical composition as granite, pumice, owing to its vitreous or slaggy nature, is not readily attacked by the chemical influences which produce disintegration of granite; but owing to its vesicular and porous nature, and the ease with which it is comminuted, pumice will form a soil and support luxuriant plant growth without previously undergoing the same amount of weathering necessary to reduce granite to a soil. A pumice soil may therefore contain all the elements, and in the same proportion in which they were present in the original rock, with the addition of a certain amount of decaying organic matter. The essential difference between pumice and granite is that pumice reached the surface of the earth and quickly cooled from the molten condition, resulting in the formation of a light, vesicular, non-crystalline mass, easily reduced by the volcanic and other forces to a fine powder, having an apparent specific gravity less than that of water, and therefore more easily wafted over the face of the country by wind and water currents, whereas granite cooled very slowly below the earth's surface, which has enabled the component minerals to crystallize out. These decompose unequally under the chemical weathering agencies, thus gradually allowing of the disruption of the mass of rock.

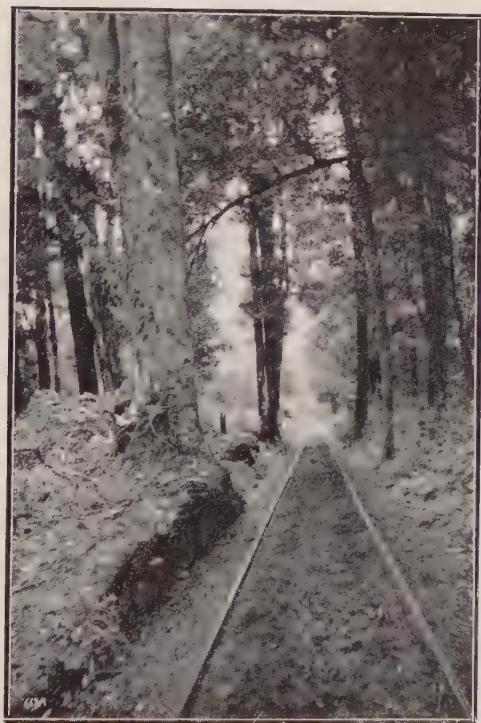
* Analyses of pumice soils are given in this *Journal* for October, 1911, pp. 307 and 308, Nos. C166 and L1123.

Eruptive rocks as a class give rise to very productive soils; but as these rocks differ widely from each other this statement must not be accepted without some reservation. They contain all the elements necessary to support plant life; but some acidic eruptive rocks, such as obsidian (volcanic glass), pumice, and the volcanic ash derived from its pulverization, decompose with extreme slowness, owing to their glassy nature. Basic eruptive rocks are much more easily weathered, giving rise to red or dark coloured heavy soils; the acidic eruptive rocks, on the contrary, are with difficulty weathered, and give rise to soils light in texture and colour. The volcanic glass soils of California are usually unthrifty, and bear a small growth of pines, but there is a vast difference between the rainfall of California and that of Taupo.

So far as one can learn there is no other country having similar climatic and agricultural characters as those obtaining on the New Zealand volcanic plateau. Here we have large areas of flat and hilly land covered to a depth of many feet with a layer of wind-borne pumice at an altitude of 1,000-5,000 ft., with a rainfall of 50-70 in., and varying in its vegetable covering from forest to desert scrubs. It is the copious rainfall

which probably saves the situation, for in dry climates sterility follows a light soil resting on a permeable sub-soil (Warming). The pumice soil readily allows the heavy rainfalls to rapidly drain away, and, owing to the excellent capillarity of the soil when compacted, permits the soil water to ascend from below where this is possible. Owing to the absence of clay particles the soil can be worked at any time, wet or dry, without danger of puddling. The entire absence of clay particles is indeed a matter for regret. On the Kaingaroa Plains, owing to the alternate freezing and thawing, the young plant may be "heaved" out of the ground.

This is due to the upward expansion of the surface soil



MIXED FOREST ON PUMICE AT 1,800 FT.—
MAMAKU, NEAR ROTORUA.

Photo by B. C. Aston.]

in freezing, the plant root being thereby ruptured. On thawing, the soil surrounding the upraised plant is apt to settle down, especially in the case of rain, leaving the roots exposed either to drying or freezing as may be.

It is a matter of common remark that the clovers grow luxuriantly in cleared bush pumice lands; and even on the scrub lands, where the wild horses and cattle have tramped and manured the soil, the white clover has successfully established itself. This is no doubt due to several reasons. The chief is that clover-seed has been introduced by stock, but there is also the fact that it germinates under favourable soil conditions. The droppings of stock act extremely favourably as an ameliorating agent on pumice soils. The complex organic acids formed by the decomposition of organic matter (humic acids) act strongly upon the more readily decomposable silicates in the soil, and in the course of time will dissolve out most of the plant food. The underclays of coal-beds, and the lower portions of peat-beds, as well as peat and coal ashes, are almost wholly destitute of mineral plant food (Hilgard). It has been shown that the richer the organic matter humified is in nitrogen the more energetically it acts in rendering available the mineral matter of the soil for plant nutrition (Snyder). With the increase of humus in the soil there is also a corresponding increase in the amount of mineral plant food which may be extracted from a soil by 4-per-cent. ammonia (Ladd). The intensity of nitrification is dependent upon the porosity of the soil (Hilgard). The greater the porosity the more intense the nitrification, by which is meant the conversion of the inert nitrogen of humus into active soil nitrogen, the most expensive fertilizer ingredient. It is probable that in these pumice soils the oxidation of humus will be exceptionally rapid and the valuable nitrates will be washed away and lost unless some check is imposed. It is always found that humus accumulates if the soil be kept covered by vegetation, whereas if the soil be kept stirred or if vegetation is unable to cover the surface the humus is fast oxidized and the soil thereby depleted of this all-important constituent. The clothing of these desert scrub plains with a permanent sward of vegetation would therefore suggest itself as a possible method of treatment, but before this is accomplished it may be necessary to sow green leguminous crops such as clovers, alsike, cow-peas, vetches, and plough them in. The dominant plant food required for legumes is potash, and this is present in abundance in the pumice. The selection of a suitable crop must be carefully considered, and plot experiments should precede any extensive planting in order that the dictates of theory may be verified. It may be found possible to grow lucerne as a permanent crop, though the altitude and inland situation must be remembered in considering what a suitable leguminous crop to introduce. Where the pumice is loose and apt to be blown about by the wind the planting of belts of quick-growing trees (even though such may be useless for purposes other than

shelter) and live fences such as gorse and broom, should be experimented with in an endeavour to mitigate the effect of wind and frost. Some areas richer in humus will be found suitable for the growth of root crops such as beet, mangels, and turnips, which would form a most welcome addition to the pasture ration of stock. The depth of the pumice layer and the nature of the underlying rock are important points to be ascertained. It is possible that this will exercise a considerable influence on the fertility of the super soil. At Tongariro, for instance, there is beneath the pumice a rock richer than it in plant food (Thomas). Leguminous deep-rooting plants such as lucerne are able to obtain their food several feet below the surface.

Improvement in pumice soils must depend largely on increasing the store of humus and by application of phosphatic fertilizers. There is some evidence that superphosphate and basic slag are the most suitable phosphatic fertilizers to apply. I attach great importance to the need of increasing the content of humus on pumice lands, not only because it will improve the mechanical condition of the soil, but because a very great increase in the availability of the plant food may thereby be effected.

There is not wanting evidence that pumice soils are capable of very great improvement. Where humus has accumulated large amounts of available phosphoric acid and potash are found—for instance, at East and West Taupo (J853-4), at Tokaroa Plains, at Arahiwi (G37), Oteroa (M798), and Rotorua (L1121), and this is not due to there being a greater amount of plant food in the original rock, for the total amount shown by analysis is often not greater in the richer soil than in the poorer. It seems certain then, that when once these sandy plains are covered with vegetation they may be expected greatly to increase in fruitfulness.

GRASSING DENUED AREAS.

WITH the object of testing certain varieties of grasses on the denuded areas of Central Otago plants of these have been established at the Ruakura Farm of Instruction and transplanted into special boxes for conveyance to Otago. The object of sowing the seed at Ruakura and breaking up the established sods into individual plants to be established before transplanting in the final environment is that the subdivided plants may thereby make vigorous growth, by sending out their new rootlets, and thus be not so liable to receive a check when planted out in Central Otago.

“Taking the Upper Waitaki country generally, and comparing it to what it was a few years ago, and even again as late as eighteen months ago, it is really wonderful to find such an improvement and reduction in the rabbit pest, and it is also gratifying to see the native grasses establishing themselves again on this country.”—*S. M. Taylor.*

THOROUGH CULTIVATION.

THE possibilities in thorough cultivation are generally conceded to be very great; but few farmers realize its power in transforming poor and discouraging soils into good seed-beds. It is raw and unkind land, promising but little or no return from ordinary methods, which furnishes the most striking examples of the power of thorough working of the soil, especially when this is combined with proper drainage. A good instance of this may be seen at the Ruakura Farm of Instruction. A field of burnt-out swamp, covered with rushes and poor swamp grasses, was taken in hand. After being partly worked, it was drained by means of 3 in. field-tiles, laid from 2 ft. 6 in. to 3 ft. deep and from half a chain to a chain apart. The land was worked thus: May, 1911, ploughed with double-furrow plough to a depth of about 4 in., the plough being followed by the Cambridge roller; August, 19th to 21st, disc-harrowed twice; 28th August, ploughed with digger-plough, 7 in. deep; 1st September, levelled with leveller; September, 12th to 15th, four times disced, the worst portion being worked six times; 21st September, gone over with leveller; 22nd September, tine-harrowed; 28th September, rolled with Cambridge roller; 29th September, double disced; 5th October, levelled and tine-harrowed; 10th October, disc-harrowed; 18th October, disc-harrowed; 7th November, disc-harrowed and levelled; 12th December, tine-harrowed and disced; 16th December, tine-harrowed and disced. This working may appear excessive, but in view of the refractory nature of the swamp land it was imperative if a really good seed-bed were to be secured. In any case, special and constant working of such soil is necessary in order that as much of the top layer may be exposed to the action of the sun and air as possible. Before all things aeration is required, and drainage and thorough working are the two most effective means to this end.

The result fully justified the method of preparation adopted, and provides a good object-lesson in effective cultivation. The seed-bed was excellent, not a weed being in sight. Swede manurial and variety tests were laid out, and so far the roots present the appearance of being in a very congenial environment.

At Ruakura this season all the undrained land has been laid down to clovers and grass, as, in the opinion of the Manager, Mr. Primrose McConnell, it is not profitable to crop it in its present state. If all other preparatory means to good crops are taken but drainage is neglected the cost of production, he thinks is too great an offset against the average of returns.

L A M B S F O R E X P O R T .

T. W. LONSDALE.

For generations breeders of pedigree sheep have vied with each other in producing animals of fixed type and high standard, and present-day breeders are ever ready to laud the predominant qualities of the breed they favour. In endeavouring to arrive at an impartial estimate of the value of the various breeds it is always necessary to consider the peculiarities of climate, soil, and environment. While this applies with special force in developing a flock of purebred sheep, it holds good, in a minor degree, in determining which breed will give the best fat-lamb sire. There are other factors, of course, to be taken into account in this latter connection. The nature of the country and the feed available are of first importance. It is necessary, for instance, if such a breed as a Southdown is to show to advantage that the crossbred longwool ewes as well as the Southdown ram be of decent quality and that they should all have been done well. It is only then that a high percentage of lambs will be got away fat off the mother and the whole of the progeny will be fit for export, either as lambs or hoggets.

In further elucidation of the fat-lamb problem a series of tests are being conducted at Moumahaki Experimental Farm. The experience of this season is instructive, but cannot, of course, be regarded as conclusive.

The ewes chosen were aged sheep showing a decided Romney-Lincoln cross. These were mated on the 28th February, 1911, with Southdown, Border Leicester, and Dorset Horn rams, two rams of each breed being allowed to a hundred ewes. The percentage of lambs to each breed of rams was approximately equal, though during the early part of the lambing season the Southdown-cross lambs predominated. There was, however, no difference with regard to fattening, about equal quantities of lambs by each breed of rams being drafted for export on three occasions.

In order to compare the produce of the different rams the lambs were weighed prior to leaving the farm, a draft of 110 of equal quantities by each lot of the rams. It was found that lambs by Dorset Horn rams averaged 0.29 lb. each heavier than the Southdown-crossed lambs, and 1.18 lb. heavier than the Border-Leicester-cross lambs. The dressed weights as obtained from the freezing company were decidedly in favour of the Southdown cross, the lambs of which dressed 1.9 lb. heavier than the Dorset Horn cross and 2.3 lb. each heavier than those of the Border Leicester cross.

Though the Southdown has proved its superiority in these trials it is not advisable to rely entirely on this breed, for unless lambs of this cross are disposed of early they are of little value as stores.

EARLY SHEEP FEED.

THOUSAND-HEADED kale, with a little turnip-seed intermixed, has been sown at Ruakura Farm of Instruction this autumn with the object of providing early spring food for the stock, ewes and lambs in particular. It is expected, by reason of having this early supply of green fodder, that lambs will be got away fat fully five weeks earlier than heretofore. The area planted is 18 acres. Three manurial tests are being made, basic slag ($4\frac{1}{2}$ cwt. to the acre); basic slag and superphosphate, ($2\frac{1}{4}$ cwt. of each), the former being applied through the manure coulter and the latter through the seed coulter; and superphosphate ($4\frac{1}{2}$ cwt.) The land (a heavy loam on a clayey pumice subsoil) recently came out of oats, which followed pasture. The land was thoroughly well prepared for its present crop, being ploughed to a depth of about 7 in., rolled, double-discd, tine-harrowed, rolled, double-discd, levelled (with a home-made heavy wooden clod-crusher, a wooden platform, 8 ft. by 5 ft., with four pieces of 6 in. by $2\frac{1}{2}$ in. timber fixed to the bottom on edge at an angle of 45 degrees, thus levelling-up the rough ground), and finally chain-harrowed. The seed (2 lb. of kale and $\frac{1}{2}$ lb. of turnip-seed to the acre) and manure were planted through the double-ridger.

APPRECIATION.

"GOSSIP," of the *Sydney Stock and Station Journal*, who recently passed through New Zealand after a world trip in the interests of his paper, makes the following comment on the Ruakura Farm of Instruction:—

"To-day my friend drove me out to the Ruakura Experimental Farm; and after seeing a lot of similar institutions in Canada and other parts of the world it was very interesting, but the main thing about it that haunted me was the fact that it was once all poor, miserable land, mostly reclaimed swamp, and now it is a veritable garden of the gods. We sat, in the evening, on the front verandah of the homestead and looked over as lovely a picture as the heart of man could desire—long stretches of rich cultivation, grand clumps of trees—firs, poplars, sycamores, and eucalypti—all imported trees—and beyond all, on every side, bold, sky-reaching hills, and above all a blue sky and great masses of solid white clouds. The white houses and red roofs of the farm buildings, and the neat dwellings of the farmers—all red and white—set in frames of living green, made a picture which was exceedingly pleasant and gratifying to a member of the same race as made it all. This experimental farm, a thousand acres in extent, was nine years ago a wilderness of tea-tree, sand, scrub, and desolation. To-day it is an object-lesson not only to New Zealand but to the whole world."

COW-TESTING WORK.

CONDUCTED BY MARLBOROUGH HIGH SCHOOL.

L. J. WILD, M.A.

THE Marlborough High School Cow-testing Association owes its origin to an offer made by me to seven suppliers of the Wairau Butter-factory to test their herds in accordance with the method adopted by the Dairy Produce Division of the Department of Agriculture. The scheme was made possible by the courtesy of Mr. Valentine, manager of the factory, who undertook to collect the samples and deliver them to me at the Marlborough High School, where the testing is carried out.

The members of the association represent different parts of the district, and it was soon discovered that their herds varied from "good" to "indifferent" in quality. Testing began in October, 1911, the majority of the cows coming into milk during that month. Some, however, had come in early in the preceding winter, and their milk-yield was thus on the decline. The testing in these cases is somewhat unsatisfactory, as the cows are credited with a lower yield than is their due. However, it is intended to take them up again as soon as they come in on next calf, and so their true value will be probably found next season.

Before testing began members were asked to select what they considered to be their best four cows. It is interesting to notice how the selection agrees with the facts indicated by the test. In one herd there was chosen as third-best cow an animal that in 124 days gave 107·6 lb. of butter-fat. This cow was beaten by ten unselected cows, one of which gave 134·5 lb. of fat in 113 days. Three of the four selected cows in this herd will undoubtedly be beaten by at least eight others. In another herd the cow placed third has produced 279·58 lb. of fat in 166 days, while the animal chosen as best has produced only 241·635 lb. in 197 days. Another man placed as sixth the cow that will probably turn out to be his best, judging from the results of the testing up to the present. It has produced 371·65 lb. of fat in 305 days, and, by the way, was bracketed equal with a cow that produced 291·94 lb. in 314 days. On the whole, however, good selections were made by nearly all, and the mistakes made chiefly consisted, not in failing to select the best cows, but in not arranging them correctly in order of merit. This evidence of correct judgment is to be attributed in some degree to the fact that the value of testing has for a considerable time been recognized in this district, and many dairymen have been in the habit of having individual samples tested from time to

time at the factory, though no attempt at a computation based on weight and test combined was necessarily made. This precaution, though useful, has its limitations, and the work of this association, humble though it be, goes to swell the volume of proof that the productivity of any particular cow can be determined only by a regular test of both the quality and the quantity of the milk.

The following tables very well illustrate the value of culling out those cows that the system of testing reveals to be "duffers."

TABLE A.—MONTH OF OCTOBER, 1911.

Herd No.	Number of Cows.	Herd Averages.			Highest Individual Yield calculated for Month.			Lowest Individual Yield calculated for Month.		
		Milk.	Test.	Fat.	Milk.	Test.	Fat.	Milk.	Test.	Fat.
		lb.	Per c.	lb.	lb.	Per c.	lb.	lb.	Per c.	lb.
1	11	1,073.5	4.0	42.94	1,725	3.9	62.10	825.0	3.9	32.18
2	8	1,063.0	3.7	38.94	1,410	4.3	60.63	900.0	3.0	27.00
3	29	848.3	3.3	27.99	1,325	2.9	38.72	810.0	2.4	19.44
4	10	1,116.0	3.8	42.41	1,457	3.7	53.909	666.5	3.8	25.327

TABLE B.—MONTH OF MARCH, 1912.

Herd No.	Number of Cows.	Herd Averages.			Highest Individual Yield calculated for Month.			Lowest Individual Yield calculated for Month.		
		Milk.	Test.	Fat.	Milk.	Test.	Fat.	Milk.	Test.	Fat.
		lb.	Per c.	lb.	lb.	Per c.	lb.	lb.	Per c.	lb.
1	11	642.7	4.5	29.16	780	5.0	39.00	564	3.4	19.176
2	8	791.3	4.1	32.44	1,185	4.1	48.585	600	3.7	22.2
3	25	802.8	3.3	26.307	1,260	3.2	40.32	510	3.2	16.32
4	13	620.0	4.2	25.589	900	3.8	34.20	390	3.8	14.82

Table A gives the averages of four of our herds for the month of October, 1911. The owner of herd 3, that showing the lowest average, commenced culling in December last, basing his selection of "rejects" on the results of the November testing, the cows having then been in milk about ninety days. Extra feed produced fat animals for the butcher, and satisfactory prices were realized. As a result of this weeding-out process his farm became understocked, and consequently the remaining animals received abundant fodder during the midsummer month, and better individual attention. The ultimate result of the culling was as astonishing as it was gratifying to the owner, for under the new conditions the remaining cows produced a January cheque from the factory that proved to be actually larger than that for December.

Table B gives the averages of the same four herds for the month of March, 1912. Further culling has taken place in herd 3, and the addition of two new cows of good quality has further strengthened it. No culling has taken place in the other herds. The averages in all cases show a decline, which, of course, is natural as the period of lactation advances. But the herd that shows this decline in the least degree is herd 3. Further-

more, whereas in October this herd shows the lowest average, in March it shows the highest. Again, the highest individual yield has diminished in all herds except No. 3, where it has increased. And, finally, in October the lowest individual yield for the month in herd 3 was 6 lb. less than that of any cow in the other herds. In March the cow with the lowest individual yield is not in herd 3. These facts, of course, do not in themselves prove very much, for our field of investigation is so limited, but they emphasize the facts that have been established by other associations whose operations are on a more extensive scale.

In conclusion, I may say that the value of systematic testing has been demonstrated, and is recognized, in this district, and the difficulty now is, not to persuade men to support such a movement as this, but to find time to do the work of testing the cows that are offered.

CLUB CHEESE.

MISS G. NEST DAVIES, N.D.D.

THIS cheese is sold under various names—Club, Port, Potted, Canned, &c.—and usually in porcelain jars, pots, or tins, but presents a favourable appearance when made up in a mould, so as to weigh about 4 oz., and packed in tinfoil or silver paper, with a label wrapped round, just the same as a cream cheese. It is quickly and easily prepared.

In the first place, it is essential to secure a sound, good, well-matured cheddar cheese. If this is not of the best to start with, the club cheese will have a bad flavour, and quickly “go off.” Pare off the rind, cut the cheese into small cubes, and put through a meat-mincing machine. A better result will be obtained when this is done twice. Some good butter should be secured, and, previously melted, should be added at the rate of 2 oz. per pound of cheese. This should be worked into the cheese till it is in the form of a perfectly smooth paste. Sometimes at this stage wine, usually Sauterne, is added.

It is now ready for packing. Where porcelain jars, pots, or tins are used, the insides should be first coated with a layer of melted butter, the cheese is now filled in, with a thin layer of melted butter covering the top. When put in tins they are soldered down and the cheese will keep indefinitely. The jars or pots are covered with parchment paper or tinfoil, and are kept in a cool place until sold. One great advantage of club cheese is that it does not become dry before being used up; it is very palatable, and is in a convenient form for picnics, or to go directly to the table. In the Old Country it is one of the most popular cheeses, and is usually made up into small cheeses, weighing about 4 oz. each, and packed in butter-muslin and tinfoil.



MAY ROSE II.

DOMINO II.

NETHERLAND QUEEN II.

Three of the First Holstein Cows bred at Longbeach, being by Taureau (196), imported in 1884, out of Imported Cows.

L O N G B E A C H H O L S T E I N S .

ONE of the most valuable Holstein herds of the Dominion is that developed by the late Mr. John Grigg at his famous Longbeach Estate. The foundation blood was imported direct from Holland in January of the year 1884. Even then British regulations were so strict that the cattle were not allowed to be landed in England, but had to be transferred from the Dutch vessel in mid-ocean to the New Zealand sailer. The herd has been maintained with a scrupulous regard to



TAUREAU II, ONE OF THE FIRST BULLS FRED AT LONGBEACH.

purity to the present day, though the pedigrees have not been officially recorded. Recently Mr. W. McKenzie, Secretary of the Holstein Friesian Association, visited Longbeach, to discuss the question of pedigrees with Mr. J. C. N. Grigg. After thoroughly investigating the records, Mr. McKenzie has reported to his association that the whole of the Longbeach cattle imported to the North Island are eligible for section 1 of the Stud-book, nothing but absolutely pure-bred Dutch

bulls having been used on the Longbeach Holstein cows since the establishment of the herd over twenty-eight years ago. This will be gratifying news to many owners of the black and white cattle in the North Island, where the breed is very popular. It will also be satisfactory to purchasers of bulls from the herd of the Weraroa Experimental Farm at the Palmerston North Show sales of 1910 and 1911.

LESSONS OF HERD-TESTING.

MR. JAMES DUNLOP, one of the Scottish Agricultural Commissioners who visited New Zealand last year, was the principal speaker at the recent annual meeting of the Fenwick Farmers' Society. In reporting his views on "Some of the Practical Problems of Dairying," the London *Dairy* refers to Mr. Dunlop as being the man chiefly instrumental in inaugurating the local co-operation and milk-record schemes. In the course of his remarks Mr. Dunlop declared that the milk-record societies had been of incalculable benefit to the Ayrshire breed. Their work had shown that one cow might produce more profit than ten cows. He had been asked how that could be, as it was seldom that the best cow in the herd gave double the milk-yield of the worst. They forgot that a cow had to give a certain quantity before she paid for her keep. There were numerous cows which did not pay for their keep, and the cow giving over 1,000 gallons would yield as much profit in some herds as ten cows giving between 600 and 700 gallons. Through the milk-records they had learned a lot in regard to the feeding of their cows, and they were steadily learning.

UNRELIABILITY OF SHORT TESTS.

A GOOD instance of the unreliability of short tests has been afforded by the experience with Shorthorn cows at Ruakura Farm of Instruction this season. One cow, Adelaide, a grade Shorthorn, has never given a higher weekly record than 271 lb. of milk, and yet by the 27th April she had given over 10,000 lb. of milk, with a 4-per-cent. test. The cow that gave the best weekly record among the Shorthorns—Penrose, a well-bred roan—452 lb., of 3·8 milk, promises to give a lower return for the season than Adelaide.

In the month of January there were seventy-five outbreaks of foot-and-mouth disease in Holland. In Germany there were 4,790 infected places reported in the first fortnight of February.

Mr. Richard Butt, of Levin, a supplier to the creamery of the Fresh Food and Ice Company, of Wellington, has received £337 2s. 5d. for the butter-fat provided by his herd of twenty cows during the season, from April, 1911, to March, 1912.

SILVER-BEET.

THE feeding-tests with this plant at Ruakura Farm of Instruction this season have shown that, contrary to the experience of Mr. Primrose McConnell at Moumahaki in the season of 1910, but confirmative of the Moumahaki results this year, sheep have taken to it well. Unfortunately, this plant, though commonly believed to be disease-proof, has this season become affected with a trouble similar to the mangel-disease rhizoctonia, rotting the root and the leaves at their base. The crop was attacked before the plants reached maturity. The disease is being investigated by the Biologist of the Department, Mr. A. H. Cockayne.



SILVER-BEET AT THE BELFAST CO OPERATIVE EXPERIMENTAL PLOTS, CANTERBURY.

The John Bull swede, which is very popular in the Waikato, is the only variety at Ruakura Farm of Instruction this season, out of twenty-one under test, which shows any signs of blight. Some of the swedes being tested at Ruakura were secured from the farm of the famous Guelph Agricultural College, Ontario. So far no varieties promise to equal the Superlative, with the Magnum Bonum a good second.

SEED IMPURITIES.

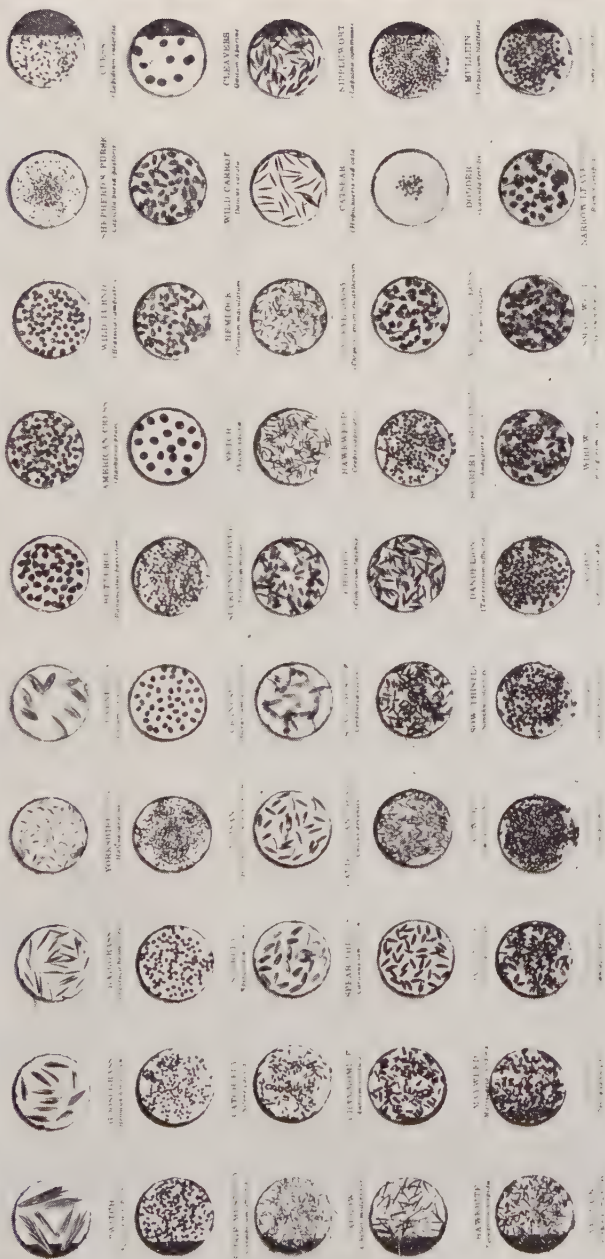
A PRACTICAL GUIDE TO WEED-SEEDS.

THERE are few farmers who have sufficiently studied the question of weed-seeds to enable them to identify at a glance the most common impurities of agricultural seeds sold in this country. At a moderate estimate weeds diminish our agricultural produce by at least 5 per cent. This represents an annual loss of nearly £1,000,000 on our agricultural exports alone, an amount considerably in excess of the total revenue from the New Zealand land-tax. The significance of this is apparent. It is considered that comparative immunity from many of our worst weeds can be secured by using only high-grade clean seed. In order that our farmers and seed-merchants may be armed with a practical knowledge of the most common impurities in agricultural seeds, the Biologist of the Department, Mr. A. H. Cockayne, has prepared a neat reference-card, mounted between sheets of glass, containing the seeds of fifty of the most common weeds to be found in ordinary commercial samples. The card is illustrated on the opposite page. Attached to it is a pocket magnifying-glass and a simple treatise on weed-seeds. This complete little demonstration guide will be offered for sale at the forthcoming winter shows at a price which will just cover the cost of preparation. In view of the importance of using only pure seed—as the most effective means of checking the spread of noxious weeds and of securing the highest return from farming operations—it is essential that some such means of weed-identification as that provided by the reference-card in question should be in the home of every farmer.

The fact is not sufficiently recognized that certain varieties of roots excel only in special soils. A variety may be famed in one district, and may give disappointing results in another.

Whereas a few years ago co-operative societies and unions of plant "breeders" in Germany were numbered, to-day almost every province and a large number of the smaller States have their own associations for seed-culture, generally in the form of small bodies of producers of improved seed, ensuring mutual recognition and joint disposal of their products. The majority of these associations are under the supervision of the agricultural co-operative societies, from whom they receive money grants — *Bulletin of International Institute of Agriculture.*

COLLECTION OF WEED IMPURITIES COMMONLY FOUND IN AGRICULTURAL SEEDS.



THE REFERENCE-CARD—REDUCED BY ONE-HALF.

ADULTERATED WINE.

SOME time ago a rumour was current that the North Auckland wine-makers were responsible for the sale of a considerable quantity of low-grade wines fortified with a very cheap spirit. The Vine and Wine Instructor, Mr. Anderson, was detailed to investigate this matter. He did so, and reports that the only wine-makers in the large district between Mangonui and Herekino are—Tadei Kunicich, Puhata, Herekino; Peter Lunjevich, Puhata, Herekino; Stephen Urlich, Uwhiroa, Herekino; John Bacich, Uwhiroa, Herekino; George Veza, Uwhiroa, Herekino: all within six miles of each other. The Wine Instructor reports that after making very full inquiries before going to the above vineyards he endeavoured through various sources to obtain some of the adulterated article, but was unable to do so. The growers mentioned have suffered considerably in consequence of the report, but they placed no difficulties whatever in the way of the Instructor conducting a very full investigation, and were only too anxious to have the charge sheeted home to the proper quarters. They gave every opportunity to Mr. Anderson to examine their stocks, cellars, stores, and facilitated his work in every way possible. The Instructor reports that though he has no proof he feels sure that the adulteration was made after the wines left the premises of the makers.—*T. W. Kirk.*

CALIFORNIAN THISTLE.

RECENTLY I visited Mr. Walter Cameron's Te Ore Ore property (Wairarapa) and, along with him, inspected eight different patches of thistle, all of which are on deep loamy soil on a river-flat. Three of the patches were treated five years ago with a thick coating of salt. On one of the patches the surface was skimmed of grass, the salt laid, and then covered over with the surface grass again. The other patches, which were not quite so large, were treated in a similar manner three seasons ago. In every case the treatment has been successful. Only on the recently treated patches has Mr. Cameron noticed the thistle appearing, about twenty small weedy plants. These he again treated last season. I myself dug down to a depth of over 2 ft., and nowhere did I come across any thistle. The grass is commencing to grow beautifully on the patches treated five years ago.—*J. S. Rankin.*

Errata.—In the article on "Lambs on Rape," on page 265 of the April issue, the average weight of the unshorn lambs, occurring in the third line from the bottom of the page, should be 57·4 lb., not 61·1 lb.

UTILIZING SWAMP LAND.

SOME interesting experiments are in progress at Ruakura Farm or Instruction this season. On land recently reclaimed from badly burnt-out swamps three systems of cropping are being tested in order to determine their relative value for such country. One portion has been planted to swedes, another (which had a crop of beans ploughed in) is carrying a young crop of crimson clover, while a third has had a crop of Bhuda kale, rape, chou moellier, and thousand-headed kale fed off preparatory to being sown down in prairie-grass (a rust-proof variety bred by Mr. A. . Green, Horticulturist of the Farm). In the field under clover small portions were sown with alsike. At the present stage of growth (the crop is but a month old) the alsike presents a much better appearance than the crimson clover. This was expected, as alsike revels in a moist situation. On swamp lands it is undoubtedly the best member of the clover family for pasture, though its life is but of three years' duration. On the clover field a manurial test is in progress. A special clover manure is being tried against basic slag, and a portion of both sections will now be dressed with sulphate of potash. On the swede section a number of fertilizer experiments are being conducted. The chief manure employed is basic superphosphate, and against this are being tested other artificials. The manurial plots have been treated as follows, the weights being per acre: Plot 1: Basic superphosphate, $2\frac{1}{2}$ cwt.; superphosphate, $2\frac{1}{2}$ cwt.; sulphate of potash, 40 lb. Plot 2: No manure. Plot 3: Seychelles guano, 5 cwt. Plot 4: Seychelles guano, $2\frac{1}{2}$ cwt.; superphosphate, $2\frac{1}{2}$ cwt. (the former was applied through the manure coulters and the latter through the seed coulters). Plot 5: The same mixture, but applied in an inverse manner. Plot 6: Basic superphosphate, $4\frac{1}{2}$ cwt. Plot 7: Basic slag, 5 cwt. Plot 8: Superphosphate, $4\frac{1}{2}$ cwt. Plot 9: Seychelles guano, basic superphosphate, basic slag, superphosphate, 1 cwt. each. Plot 10: Special turnip manure. Across all the plots cross-dressings have been applied of sulphate of potash and sulphate of ammonia, each strip being about 20 yd. in width. This season has been the first occasion on which Seychelles guano has been tried at Ruakura. So far, the results have been most encouraging. Contrary to the general opinion that this manure is slow in its action, so far the experience of it at Ruakura shows that it is as quick in action as highly soluble superphosphate. The cross-dressing of sulphate of potash and sulphate of ammonia will bring the number of manurial tests in the swede crop to a total of twenty-seven.

THE HEMP INDUSTRY.

W. H. FERRIS.

THE quality of the hemp of the past month has been fairly good throughout the Dominion. A much larger proportion than usual has exhibited an improvement in colour and stripping. The weakness has been in scutching, and this drawback has been noticeable in even some of the better grades. In the lower qualities, however, it has been a common defect. Attempting to rush the work and consequent slumming of it has been no doubt the principal cause. It has to be remembered that satisfactory work in every detail is necessary to secure a good commercial fibre.

Instances have come under my notice where millers are aiming at special quality hemp, and with a profitable result. One Manawatu miller has contracted to supply a high-pointed "fine" hemp to a southern cordage-manufacturer. The supplies that have gone forward have given every satisfaction to the buyer. North Island hemp specially appeals to local cordage firms by reason of its good length. The fibre in question has this desirable quality for cordage purposes combined with excellent colour and strength. No doubt it will be largely used with the special qualities available in the South, and which are too short for the making of certain grades of twine. Generally there is a shortage of fine-quality hemp in the South Island, owing to several mills having good leaf not working this season.

An important improvement is being effected at several Manawatu mills in stripping-machines. A drawback to the stripper in vogue is that it is too narrow to permit of heavy feeding with satisfactory results. Only from two to three large blades can be well stripped, and when a greater number are fed, as is too often the case, the stripping is ineffective. The improvement being made is to widen the whole machine, so that with broader and heavier drum, rollers, and beating-bar more blades can be fed and with satisfactory results. This means greater economy in production, while the quality of the fibre is not affected. A necessary consequence will be an increase in the size of the washing machinery in use.

A weakness in feed-rollers which has been causing much trouble has been the liability of the rollers to grip the thinner portion of the blade of flax, with the result that this part of the blade has been often left quite unstripped, and, as no after-process could remedy the defect, the grade of the fibre has had to be reduced. A method adopted to overcome this

trouble was the provision of pinions, which, however, sometimes failed to act. A better idea has been introduced in the mill of Messrs. Coley and Bock. This is an improvement in the pulley which keeps the top roller constantly revolving, thus always holding the blades in position. Several Foxton millers have copied the new principle, permission to use which may be obtained from the originators, the firm mentioned above. Not only does this effective holding of the blades permit the whole of the fibre to be secured, but it enables the feeder to put a much larger amount of phormium through the stripper.

At one time the flax-mill was invariably on a small scale, only one stripper being employed. It was considered impracticable to duplicate the strippers in the one plant; in fact, several attempts to do this resulted in failure. Of late years, however, the adoption of improved methods and appliances has demonstrated that there is practically no limit to the number of strippers that can be used in the one mill. The saving effected in consequence has been considerable, as the output can be expanded with a corresponding decrease in the ratio of cost of production. At the present time there is evidence that a considerable extension of this principle is probable in the near future; in fact, it is not too much to predict that the single stripper will soon disappear in the Manawatu, and that small expensive plants will have to give way to concentrated up-to-date mills, in which the cost of production will be reduced to the lowest possible point.

The phormium produce graded at Foxton has increased from 11,320 bales in the year ending 31st March, 1909, to 46,631 bales in the year ending in March last, an advance for the period of 35,311 bales. Following are the figures: Hemp, year ending 31st March, 1909, 11,320 bales; 1910, 23,869 bales; 1911, 33,176 bales; 1912, 36,892 bales. Tow, 1910, 4,919 bales; 1911, 7,829 bales; 1912, 9,457 bales. Stripper-slips, 1912, 282 bales.

Hemp values are being well maintained. Good-fair has been quoted at £18, and high-point fair £17 f.o.b. Wellington. There is still a keen demand for tow. Prices are firm and the demand is unsatisfied, Home manufacturers complaining that there is not being sufficient offered for their requirements.

The following figures show the export of hemp and tow from New Zealand last year, and the destination of the various shipments: Hemp—United Kingdom, 14,152 tons; Victoria, 949; New South Wales, 936; South Australia, 144; Tasmania, 6; Cape Colony, 84; France, 3; United States of America, East Coast, 1,081; United States of America, West Coast, 10; Friendly Islands, 1; total, 17,366 tons, valued at £300,209. Tow—United Kingdom, 2,440 tons; Victoria, 519; New South Wales, 306; South Australia, 10; Tasmania, 7; France, 1; total, 3,283 tons, valued at £24,921.

THE APIARY.

NOTES FOR JUNE.

F. A. JACOBSEN.

DISEASES OF BEES.

THERE are several diseases of bees that require close attention, but that most to be feared is foul-brood (*bacillus larvæ*). This disease will in time kill a colony through the medium of the brood. It is, therefore, to the advantage of every beekeeper to study the symptoms of the disease and locate it at the earliest possible moment. The adult bees are not attacked by the germ in any way, notwithstanding the fact that the nurses in a diseased hive usually transfer the germ in the food supplied to the young larvæ. The germ attacks the alimentary canal of the grubs, killing them off and causing them to form into a sticky brown mass at the bottom of the cell. In the hands of careful, not necessarily expert, beekeepers the disease may be located early and be effectively controlled, but requires study and constant vigilance. In view of the fact that the disease is present in New Zealand, beekeepers should study all the available literature bearing on the subject, and so be well able to cope with any outbreak in his or her apiary. A leaflet entitled "Foul-brood in Bees," with a clear explanation of the symptoms and describing the treatment recommended by this Department, will be sent free to any address on a request being forwarded to the Publication Section, Department of Agriculture, Wellington.

It is difficult to keep apiaries entirely free from infection, especially when there are careless beekeepers in a district who treat their colonies in a slipshod fashion. Every enthusiast should watch his district carefully, and in the event of an outbreak should try to induce his neighbours to treat their colonies simultaneously. This should especially be done early and late in the season, when a certain unavoidable amount of robbing is going on. In the middle of the honey-flow it is not so necessary to treat all at once, but care should be taken to get rid of the disease at the earliest possible moment. Diseased colonies should never be shifted to any new location, not only because the Apiaries Act forbids it, but because it would not be fair to beekeepers surrounding the new position.

The correct name for the above disease is "American foul-brood." It is akin to "European foul-brood," which has not sufficiently developed itself in this country for beekeepers to be sure of its presence. Another disease is "chilled," or, as it is sometimes called, "pickled brood." This requires no special treatment, the dead grubs being removed by the bees, and the colony becoming normal again of its own account. Bees also suffer from "dysentery," which is caused by them being confined to their hives for too long a period. In the early spring a dark-brown excrement may sometimes be noticed spotted over the combs. When this is noticed the bees should be given an early flight in the open. Colonies frequently die in cold climates, because of their inability to take a fly, and so void the fœces. Bees in normal condition never deposit their fœces in the hive. One of the chief causes of "dysentery" is the consumption by the bees of a poor quality of honey, or honey-dew, during their winter "sleep." To avoid this condition keep them supplied with a good quality honey, or feed sufficient sugar syrup to keep them in strong condition until the days are sufficiently warm to induce a cleansing flight.

"Paralysis" is another ailment which affects adult bees. This may be detected by seeing bees listless on the combs and front board with trembling wings and their bodies abnormally large and shiny. Sulphur sprinkled over the combs is claimed to have a beneficial effect, but I think killing the old queen and leaving the bees queenless for a fortnight or more before introducing a fresh one is the best cure. There are several other diseases, but they do not affect the beekeepers of New Zealand to any noticeable extent, and I doubt much if they are present at all in this country.

ENEMIES OF BEES.

There are numerous enemies of bees, such as insects and birds, and among the former wax-moths may be considered the most destructive. There are two species of wax-moths, the larger being named *Galleria mellonella* (L.) and the lesser *Achroia grisella* (Fab.); the larvæ of which destroy combs and brood by burrowing through them. The one which most affects us in New Zealand is the larger moth. The cure is for all beekeepers to keep strong colonies. I have never yet discovered the larvæ of this wax-moth in a strong colony, and have only occasionally seen them in weak ones. Sometimes queenlessness, or a dearth of stores, may be responsible for the pest being present. Any supers of comb should be stacked perfectly bee-proof, so that moths or insects of any description cannot get at them. If the above advice is adhered to beekeepers will have no trouble with wax-moths.

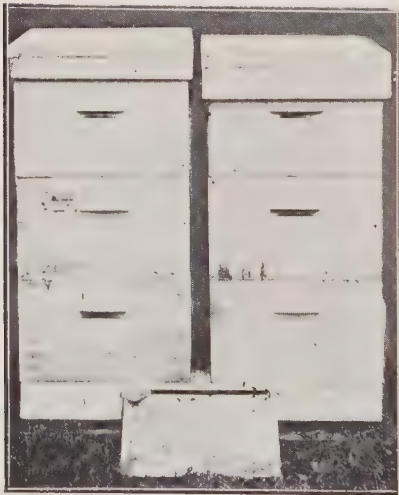
Blackbirds and sparrows frequently swoop down to the front of a hive and peck up a few bees, and should certain of these birds make this a practice they had better be shot. In the above manner I have seen hives dwindle down to only a few bees before the correct source had become known and action could be taken.

PRODUCING BEESWAX.

Beeswax is a commercial product of some considerable value. This wax is secreted by the bees for the purpose of building their combs. In every apiary more or less wax is accumulated through the season from various sources, such as the removal of old combs, &c., and these may be melted down partially in the "solar" wax-extractor. Old combs contain a considerable amount of wax even after going through the "solar," and may, if it is desired to save all the wax, be further treated in boiling water or by the use of a reliable wax-press. The refuse, or slumgum as it is called, makes an excellent fuel for the fire, and should be burnt or buried out of the way of foraging bees.

THE "HAND" SWARM-CONTROLLING HIVE.

The illustration shows a hive that is being successfully operated by a leading Canterbury beekeeper who took the idea from an article written by J. E. Hand in "Gleanings in Bee-culture." It consists of a double bottom board that has an entrance back and front,



and so constructed that the bees in the field may be switched from one hive to the other at will. Should the bees in one hive show indications of swarming, the switch is put over to that side, thus turning all the field bees into the other hive, and reducing the force of bees in the hive that intends to swarm. This has the effect of eliminating the swarming fever, and allowing either hive to secure a good force of bees when they are most required. Both back and front switches are screwed into the centre of the bottom board, and may be moved from side to side of either entrance.

THE "HAND" SWARM-CONTROLLING HIVE.

GOVERNMENT BULLETINS ON BEES FOR FREE DISTRIBUTION.

The Department supplies free of charge to all beekeepers a bulletin on "Bee-culture" by I. Hopkins. Application for it should be made to the Publications Section, Department of Agriculture, Wellington. A leaflet on "Foul-brood" is also supplied, as previously stated. Beekeepers having any difficulty in reference to bee management should write to the Division of Orchards, Gardens, and Apiaries, clearly stating their case, when information will be gladly sent them, either privately or through the columns of this *Journal*.

BEEKEEPERS' ASSOCIATIONS.

There are a number of these associations throughout New Zealand, formed for the benefit and betterment of the industry, as well as for the purpose of aiding beekeepers by discussions on any problems that may from time to time confront them. Several associations have co-operated to secure their bee-supplies in bulk, thereby obtaining a substantial reduction in the price of their goods. Any one desiring to join the nearest association may write to the Division of Orchards, Gardens, and Apiaries, Department of Agriculture, Wellington, when the address of the secretary of the most convenient society will be sent. All associations are affiliated to the National, which has its headquarters at present in Christchurch. A conference will be held, probably in Wellington, next month. Discussions on the advisability of establishing a depot in Wellington with a view of grading all honeys exported and other important factors in the bee industry will be dealt with.

FOUL-BROOD IN NORTH OTAGO.

LAST month one of the southern papers reported: "A North Otago beekeeper states that if the district cannot be cleared of foul-brood it is his intention to get out of the honey business." On reading this instructions were at once given to Mr. E. A. Earp, Apiary Instructor for Otago, to endeavour to investigate the matter. He has done so, and finds that the beekeeper making the complaint lost seven colonies of bees in the spring, and attributed their loss mainly to the ravages of foul-brood. The Inspector made a close examination of the apiaries in the locality, and with one exception found the district clean. Near to the beekeeper mentioned is another, who has twenty-two colonies, and he has not lost a single one since 1908. A mile from the apiary of the complainant the Inspector found six weak and diseased colonies, and these were at once destroyed. It is evident therefore that some misconception was responsible for the "local" referred to, as there is really very little disease in the district referred to.—*T. W. Kirk.*

THE FARM GARDEN.

W. H. TAYLOR.

THE VEGETABLE-GARDEN.

LEEKs that have been planted in the manner advised should now be in an advanced state of growth. They will, if planted deeply in the way indicated, constitute a fine vegetable, with no other attention. They, however, may be further improved by ridging up earth against them in the following manner: Get strips of paper and bind them around the stem to keep the soil from getting between the leaves and the stems, then draw up soil to the desired height. I use old numbers of some of the weekly papers. A page cut in two is just the right size. No tying is required, and the operation is quickly performed.

Those who like to get broad beans early may sow at once. In the way of ordinary routine they would be sown early in June. This brings them into use about the latter end of October.

Spinach stands well through winter, and gives fairly large leaves if it has been properly thinned; not otherwise. See that it is done. The plants should not be closer than 9 in. to each other; better a bit further apart than closer.

Silver-beet also should stand singly, 12 in. or even more apart.

Winter rhubarb should be planted at once if it is to be of any service. If it is not planted now it would be wiser to wait till spring, and sow the seed.

In well-drained soil it may be some advantage to sow peas at the end of this month, May. It is a regular practice with some. In ordinary places the advantage is not great. It means getting peas about the 25th October, instead of the 10th November; but the crop is not usually a very good one.

Jerusalem artichokes will have died down by now. There is no need to lift the roots unless the ground is wanted. It is best to leave them in the soil, and dig as required. They keep quite well in the ground, and may be left till they show signs of growing in spring.

Asparagus will be ready for cutting down. This should be done before the ripe berries fall. Cut quite close to the surface. If possible give a good dressing of farmyard or stable manure. There

is no advantage in giving salt or other fertilizer at this time, as it would be leached through the soil before the roots become active.

Those who are growing seekale may force it for use at any time after the old leaves are dead. Seekale is not as generally cultivated as it should be. In all large homestead gardens it should find a place, for it ranks high as a choice vegetable, being always acceptable, particularly so when the owner entertains at all. All through winter and well into spring it may be available at any given time with due notice. As its cultivation is not very generally understood among station gardeners a few lines on it may be acceptable.

SEAKALE.

The first consideration is rich soil. Do not grow it if you have not that. Fairly deep it must be too; so trench a patch, and work in some manure in the lower layers of soil. Never mind the top, but keep the top soil still on top. A start may be made with seed; but you will only need this once, as there are better ways of propagation once you get a start. The seed may be sown in spring, when the onions are sown. Sow in rows 30 in. apart, and put in two or three seeds at intervals of 24 in. in the rows. The spaces between the rows may be utilized for other crops—lettuces or French beans—for the first season. The seed may be raised in beds and transplanted. I prefer the former plan, as it offers a reasonable chance of a cutting the following winter, which would certainly not be gained if the seedlings had to be transplanted. During summer every means should be taken to encourage growth, by keeping the surface stirred, mulching in dry weather, and watering with liquid manure if possible. The greater the growth, the better the result. Whether one, two, or three seeds come up where they were sown, they may be left as they come. It will be all the same in the end. One plant is likely to grow strongest, but two or three supply more crowns for the start. Future propagation for extending the bed is done by whips of the roots. To secure whips, lift the necessary number of plants and cut off the roots, those as thick as the little finger of the hand will be suitable. Cut them into lengths of 5 in. or 6 in. Plant in rows in the same way as the seed was shown. The whips are to be planted in a perpendicular position, with the top just clear of the soil. This I like to cover with a little coal-ash, to keep slugs away. During the first season of growth the whips should be allowed to make only one shoot each. These sprout out from the top end of the whip. More usually appear, but they should be reduced to that number. I like three whips in each place, so as to provide three good crowns, for when forced for the first time they are unlikely to push up as many

shoots as a seedling, though of better quality. This explains the two ways of establishing a bed, and it only remains to add, in this connection, that, quite likely, the above plan may not agree with Old Country methods, as advised in books. The difference in climate, however, renders other means of forcing applicable, hence different methods.

Forcing may be done at any time after the old leaves have died off. If the bed is of useful dimensions it may be continued all winter, and during spring blanching may be done without forcing. In Great Britain special pots are in use for covering. These are somewhat bell-shaped, and have at the upper end a movable top. In this country we use what we can, from kerosene-cases to the useful kerosene-tin. Whatever is used it must be open top and bottom, but the top must be covered with something movable. The crowns are to be covered with the box, or whatever is used, first dusting around the plants with lime to ensure that no live slugs are enclosed. The top is laid on, and the whole is covered with fermenting manure. The manure should be of a strawy nature. A covering of 1 ft. above the box, as well as all round, is sufficient. The crowns are usually ready in fourteen days from covering, provided the manure keeps its heat. When ready for use the shoots are almost pure white. The leaves, just beginning to unfold, have the edges delicately tinted with pink. The crown is cut with a piece of the stump attached; so that it remains intact. Having cut the crowns the top of the box must be left off, so that light may reach the plants. Later on, as convenience suggests, the manure is removed. The old crowns break into growth, sending out quite a number of side-shoots. If there are at this time three or four crowns in the clump then allow each crown to bear but one new one. Remove all the other shoots at once. When spring comes in it is not necessary to force growth, it comes naturally; hence covering is only for blanching. The crowns are not usable unless blanched. Covering with soil over the boxes is sufficient, and even the boxes may be dispensed with on very light soils. All that is necessary is to throw a ridge of soil, about 12 in. high, above the crowns, and the shoots will draw up into it. The soil is pulled away when experience tells that the crop is ready.

This season the Commonwealth has exported 1,183,802 cases of fruit, principally apples, to British and German markets, an increased export over that of last season of 244,396 cases. The season's shipments of the States are as follows: Tasmania, 687,769 cases; Victoria, 283,721 cases; South Australia, 166,649 cases; West Australia, 40,716 cases; New South Wales, 4,947 cases.

THE FLOWER-GARDEN.

W. H. TAYLOR.

ROSES may now be planted with advantage in most places; indeed, one may say that if a place is fit to grow roses now is the best time to plant them. There may be reasons for planting roses other than adding new ones to the collection. It may be desirable to move some in one's own garden while some may be growing too strongly. This will be only in the hybrid perpetual section, for it is hard to think of any others growing too strongly, however vigorous they may be. The hybrid perpetuals must, from their habit, be kept rather closely pruned. Most of them would get very ugly-looking if they were not hard-pruned. Yet this does sometimes prevent satisfactory flowering. In such cases transplanting, by causing a check, will restore them to a flowering condition. Transplanting is best done at this time because the leaves, being still active, will promote immediate root-action, which enables the bushes to become established in their new positions before growth ceases; consequently, when pruning-time comes, they are in practically the same state as those bushes not shifted, with the advantage that the strong roots have received the check they needed. Bushes transplanted at this time are not to be pruned at the same time, but they may be relieved of some growth so as to render them less top-heavy. Planting should be done in such a manner that the soil is very firm around the roots. The manner of doing it is to dig the hole wide enough to accommodate the roots when spread out horizontally. The hole is then to be nearly filled with soil. Give the bush a shake, so as to settle the soil between the roots, and tread down very firmly. Now fill up to the proper level with soil, and leave it loose.

Most trees and shrubs can be transplanted now. Whether it is wise to do it must depend on circumstances. Generally speaking, on hilly ground, and all well-drained situations, autumn planting is best; in fact, it may often be said with truth that planting in autumn instead of spring is a gain of a year. Whether this is so or not depends entirely on local conditions. If the place to be planted is subject to cold winds in winter or early spring, and the soil is liable to hold water, then it is sure to be best to plant in spring, for experience has shown that in such circumstances the roots are liable

to rot from excess of water, while the cold winds do not encourage the plants to make new roots; consequently they frequently die. Left till spring, when the soil has become warmer, the plants have a much better chance of starting. The drawback is that they seldom make any appreciable growth that summer, though they usually in such places make good autumn growth.

Rose-cuttings will now root freely. The hybrid perpetuals and hybrid teas are easiest to root. Cutting should be made of the past season's growths. Wood of fair thickness is best. Make the cuttings from 8 in. to 10 in. long. Cut square across, just below a bud, insert the cuttings in the soil to two-thirds their length, tread the soil around them so as to make them firm at the bottom, and leave the soil loose at the top. Tea-roses and most of the other classes will seldom root from cuttings of the kind just described. The cuttings should be made of twiggy growths. These should be torn off the parent so as to secure a heel of the old wood. Cuttings of that sort nearly always root.

Cuttings of penstemons, calceolarias of the shrubby sorts, and ageratums usually strike freely in the open at this time. The cutting-bed should be in a semi-shaded position. Unless the soil is very free in character it should be surfaced with sand; in fact, it is a very good plan to use the sand in any case, for it serves to keep weeds down, and weeds in crowded cutting-beds are a very great nuisance.

Plants of lobelia may be pulled to pieces and little bunches of it put in as cuttings. There is at this time always a lot of roots just starting from the stems above ground. When put into the soil they quickly develop.

Herbaceous plants of all kinds may be transplanted now.

Perennial phlox, penstemons, Michaelmas daisies, and such things require renewing now and again. They seldom die out. On the contrary, some of them get altogether too aggressive; but when the clumps get too wide the flowers are apt to, and usually do, get poor, the centre part not getting enough nourishment. It is best when this state is arrived at to choose a piece from the outer part of the clump for replanting, and throw away the rest. There are some notable exceptions to this rule. The alstromerias, some of which are very desirable plants, never make a good showing of flowers until they have been several years undisturbed, and the less they are disturbed afterwards the better they seem to do. The heuchera, again, is not satisfactory until it has become crowded. Then, and then only, it seems to flower with freedom; so, if your plants are not doing well, let them alone and they will work out their own cure.

That very fine old plant—Solomon's seal—is good to plant now, and it also, when established, may be left alone to spread out over the land, or it may be lifted and shifted just as you like, for it does well in any way. This is a very nice thing for lifting for room-decoration, and is easily managed in this way: Get some sphagnum-moss from the swamp, lift a clump of the Solomon's seal—never mind about soil—wrap it up in a liberal quantity of the sphagnum, which bind on with fine wire, stand in a plate in which is a very little water, and you have a fine room plant. Native ferns may be treated in a similar manner, and will thrive much better than they usually do with amateur potting.

During December and January a heavy supply of both American and Canadian fall and winter apples, mostly carried in storage, has been available at Vancouver. The stocks of apples carried in and out of storage disappear about March, at which time importations from the Antipodes should commence.—*N.Z. Trade Commissioner, Vancouver, 13th March, 1912.*



THE TABLE-CENTRE OF COSMOS AND RHODES-GRASS ARRANGED BY MRS. PRIMROSE MCCONNELL AT THE CEREMONY OF THE OFFICIAL OPENING OF THE RUAKURA FARM OF INSTRUCTION.

THE POULTRY INDUSTRY.

F. C. BROWN.

MATING.

It is a mistake to mate up the breeding-pens just before the eggs are required for hatching. The safer and the better plan is to make up the pens some time in advance. Thus, where it is desired to put down sittings of the heavier breeds in July or August, it is well to mate the birds in June. They will then have good time to settle down, and there will be greater surety of obtaining fertile eggs. The lighter breeds should not be mated up till July or August, September being the best month to hatch White Leghorns and birds of similar type. When pens are first mated up the male bird will exhaust itself at the outset, and it will be some weeks before it settles down and satisfactory fertility is obtained.

It is a very wise precaution to use trap nests in the breeding-pens, with the object of discovering birds laying small or misshapen eggs. The trap-nests need only be used for the first week or so. Where this ready method of detecting unsatisfactory birds is not possible it is desirable to place a few extra birds in the pens, so that only perfect eggs may be employed. Again, trap nests used at the start have been the means of at once discovering a bird laying infertile eggs. When located in this manner such eggs can be marketed, whereas if the infertility is not observed till the eggs have been a week in the incubator they are next to useless. There is, again, a distinct advantage in using trap nests for the initial testing of breeding-stock, in that the work of breeding is thereby made more certain, and is robbed of much vexation and annoyance. Of course, it is necessary to successful results to select the most vigorous stock in the first place; and if egg-production is the objective the birds should possess some pedigree of performance. The male bird should be the son of a heavy layer, just as the females should be descended from birds noted for their egg-producing capacity. A mistake to be guarded against is using fowls in a breeding-pen which have just come through a heavy and forced laying season. In selecting the breeding hen or pullet it is not so much the egg-yielding capacity that should be studied as the power to transmit desirable characters; and it is obvious that if a bird is not in the pink of condition she will not be able to impress these upon her offspring. It is certainly true that if a hen can lay over 200 eggs in the season she must

have a good constitution; but surely it would be much safer and better to wait till she has had a rest before taking her eggs for hatching than using the eggs she produces at the end of her exhausting laying season.

No hard-and-fast rule can be laid down as to the number of hens or pullets to be run with the rooster. The nature of the quarters has an important influence on this matter. I have known complaints of non-fertility where only half a dozen hens were in the pen; but the pen was small. When changed to quarters where a good free range was available the fertility was all that could be desired. Generally speaking, given fair conditions under confinement, the proportion should be six to eight hens of the heavy breeds, and ten to twelve of the lighter breeds.

It cannot be too strongly emphasized that birds in a breeding-pen—which, by the way, should always be in a dry situation—must have good exercise. If the run is not large there should be ample litter provided, in order to induce them to take exercise. If the birds are not kept thoroughly fit vigorous progeny cannot be expected.

The feeding of the breeding-pen is all important. Solid food is essential. The best of grain only should be used, and the contents of the morning mash should not be of a forcing character. I have known excellent fertility and most gratifying stock resulting from the feeding of grain to the breeders night and morning, the grain being given in a manner that would induce the maximum amount of exercise—supplied in deep litter. It is a mistake to provide too large a proportion of animal or other forcing food. At such a time birds cannot be oversupplied with green stuff, while ample fresh water and grit are details which must not be neglected. One big advantage in feeding ample grain in the litter is that the hens are not encouraged to become over fat while the rooster is starved, as is too often the case where the feed is thrown down all at once, and is eaten up by the hens before an attentive male bird has helped himself, in which case it is impossible to get good results. I have known a careful man who has overcome the trouble resulting from the male bird being too attentive—and such birds are naturally the best breeding-stock—by feeding him by himself. After the birds have gone to roost he has taken some feed into the house by candlelight, and has lifted the head of the pen off the roost for his special supper. After a few nights he would hop down when the food was placed in front of him.

When a two- or three-year old rooster is used the spurs are often a serious drawback, generally resulting in infertility of the eggs. I have seen hens with their sides badly ripped in consequence. The points of the spurs should be nipped off with a sharp knife, or, better still, the spur removed by a fine saw. If a little Stockholm tar is dabbed on the surface of the cut little or no bleeding will result.

FEEDING THE BREEDERS.

A correspondent wants advice in regard to feeding his breeding-birds. He says they have free range, and he would like to know how to prevent them exhausting themselves by heavy laying, in order that they may be in good nick for the breeding season. In this case the answer is a simple one: Cut all the meat, or any substitute for it out of the ration. The birds having free range will pick up sufficient animal life to keep them in good form without unduly forcing them. It has been repeatedly emphasized in these pages that it is a mistake to place a hen in a breeding-pen just at the conclusion of a heavy laying period, for the reason that it will then necessarily be in a more or less exhausted condition, a condition requiring rest. She is obviously not in that vigorous condition necessary to produce eggs having a strong germ—the seed of good-constituted stock. My correspondent evidently recognizes this essential principle, and having a free range (the best of all means of maintaining breeding-stock in health and vigour) his objective is easy of attainment. He has merely to eliminate all forcing food from the diet.

FREE RANGE.

In these days, when so much is heard of the great possibilities in egg-production with a self-contained plant on a small area of land, the value of free range for breeding-stock is apt to be overlooked. In saying that the maintenance of constitution is the most essential factor in poultry-keeping I do not think I am overstating the case. With the egg-yielding power of fowls being steadily increased, it is obvious that the demand on constitution is correspondingly increased, while the keeping of a larger number of birds to the given area is augmenting the risks from disease. The only means of dealing with disease in poultry is to prevent it, and the most effective preventive is to breed stock with that vigour which implies power of resistance, and to keep disease at a distance by cleanliness, and the provision of comfortable conditions for the stock—draught-proof but airy quarters and shelter from wind and rain, as well as protection from the fierce rays of the sun. While constitution is of paramount importance, it is in the breeding-stock most of all where it must be aimed at. In this connection there is no comparison between the vigour of the cockerel reared in close confinement and that reared under more natural conditions where free range is obtainable. I have handled many cockerels in my time, but I have never yet found one bird in close quarters that possessed the virility of those having a free range, and therefore abundant exercise in the open air.

FEEDING MOULTING HENS.

A correspondent is anxious to know how he should feed for egg-production his second-season moulting White Leghorn hens, as these are putting on too much fat. This is not a singular experience. Such birds usually take a rest from now to July. For myself, I like to see the moulting bird in good condition, as the better they are in this respect the quicker they will get through the moult, and be in better trim for starting off their second laying period. I would urge this correspondent and others in a similar position to cull heavily their second-season White Leghorns. If winter eggs are desired the pullets must be depended on to produce them. As to feeding the moulting stock, I would give them their usual ration, making sure, however, that ample green feed is kept before the birds at all times.

THE GENERAL PURPOSE FOWL.

The advancement of the egg-yielding type of bird, in which Australian breeders have played such an important part, has revolutionized domestic poultry from an egg-producing standpoint. It has also brought into great prominence, and into widespread use, the White Leghorn breed, the type which has responded best to the work of those breeders who have been responsible for the progress made in this connection. Unfortunately, the attention thus attracted to the purely egg type of bird has diverted attention from other breeds of a more general-purposes character, and whose egg-yielding power has also been advanced, though not to the same appreciable extent. When it is considered that these latter breeds, such as the Wyandotte, Rock, and Orpington, are also desirable from a table-poultry viewpoint it will be seen that they merit more consideration than they have received, especially from the farmer. Given the laying strain of any of these breeds, the farmer has profitable laying stock and cockerels which will pay to market, while he can thus depend upon having birds for hatching purposes.

The consumption of table poultry in New Zealand at the present time is not by any means what it should be, and this is largely owing to the fact that decent table poultry is hardly procurable, and what is available is too often of an unsatisfactory character. In seasons when the demand for poultry is most keen birds of the lighter breeds are often going begging for customers, whereas birds of the heavier types command extreme values. It is not the heavier bird of the old exaggerated type evolved for the show-ring which is recommended, but the medium modified type in which egg-producing power has been developed with little or no harm to its table qualities. Such birds mean two sources of profit, a fact which should especially appeal

to the farmer who can at little cost fatten his cockerels and cull birds for the city poulterer, or may obtain a decent price for these birds in a store condition. The matter of an export trade in poultry has been mooted, but it will be time enough to consider this when local markets have been properly supplied, and when decent table birds are being bred. Any endeavour to cater to the Home market with the bulk of the stock now produced would be doomed to failure. Remunerative prices on Home markets can only be secured with birds of good quality. It has to be remembered that the London market is the most critical in the world, and that while it is the best market for high-quality products it is discriminative to a degree, and will pay strictly according to the quality of the article. Recently a New Zealand shipper sent some poultry to the Vancouver market. Reporting on the shipment, the Trade Commissioner of the Dominion said, "I am sorry to state that the poultry did not give satisfaction. It was outclassed both in quality and appearance as well as in general get-up by the American supplies."

Laying strains of the self-coloured types of the general-purpose breeds referred to above are being developed on the poultry plants of the Department, with the distinct object of encouraging their adoption by farmers and small holders. In furtherance of this object the price of sittings of eggs of these special types of birds is to be reduced from 6s. 6d. to 4. 6d. Primarily the improvement of the farmer's poultry is the main objective of the poultry plants of the Department. It is anticipated that at this cost for sittings a class of poultry will be produced on the farms of the Dominion which will bring about a decided improvement in the class of table poultry marketed in this country as well as assist in making poultry keeping a much more profitable side line than it is at present.

It has been decided, in order to maintain the stock on the poultry plants of the Department at a high standard, to import specially selected utility birds from Australia. It is believed that with the several plants being conducted under varying climatic conditions and with the opportunities thus afforded of providing change of blood, it will be possible in future not only to maintain the desired type but that robustness of constitution necessary to successful hatching and breeding operations.

THE WORLD'S RECORD.

It is appropriate that a world's record should be again put up in South Australia—though the birds responsible are the property of a Victorian plant—for that State of the Commonwealth has led the world in the advancement of the egg-producing power of domestic poultry, largely owing to the splendid work in selection according to individual performance by Padman, the Adelaide breeder, and others. The record

was established in connection with the annual egg-laying competition at Roseworthy Poultry-station, which terminated on the 31st March. The leading pen, owned by the Redfern Poultry Farm, Caulfield, Victoria, laid 1,589 eggs in the twelve months, an average of 264·83 eggs per bird. They finished up with the remarkable yield of 163 eggs in March. The pen is here illustrated. Some facts in regard to the competition, taken from the excellent report of the test in the "Journal of the South Australian Department of Agriculture," make very instructive reading. There were 756 birds in the competition, and these



THE SIX WHITE LEGHORN HENS THAT LAID AN AVERAGE OF 264·83 IN TWELVE MONTHS (A WORLD'S RECORD) IN THE RECENT ROSEWORTHY COLLEGE LAYING COMPETITION.

[From the "Australasian."]

averaged 176·04 eggs. The value of the eggs averaged 11·8d. a dozen. The cost of food per pen was 4s. 11·5d., and the profit over cost of food was 9s. 5·2d. There were 600 White Leghorns in the test, and the average yield of these was 180·7 eggs. A pen of Black Orpingtons won the test for heavy breeds with 1,189 eggs. In the New Zealand competition the best pen of Black Orpingtons laid 1,246 eggs in the twelve months, and won the winter test by laying 469 eggs from the 1st April to the 31st July (the dear egg season). The best pen of Silver Wyandottes in our own competition (T. Kennedy's) laid 1,411 eggs, while the best Wyandottes at the South Australian test only laid 1,021. Again, a pen of White Wyandottes at Christchurch laid 1,332 eggs, while White Plymouth Rocks laid 1,238. Thus, while Australia is developing the laying type of the White Leghorn to a high standard, New Zealand can evidently more than hold its own with the heavier breeds.

CO-OPERATIVE EXPERIMENT RECORD.

NEW ZEALAND WHEAT.

B. C. ASTON, F.I.C.

THE samples of wheat received from the Field Instructors of the North and South Islands, Messrs. Baylis and Macpherson, during 1911, were, with the permission of the Under-Secretary of the Queensland Department of Agriculture and the kindness of the Agricultural Chemist to that State (Mr. J. C. Brünnich, F.I.C.), submitted to a practical milling test by means of a model mill constructed for the purpose. The results are given in the accompanying table, in which the wheat is judged by points, the millers' notes being given below.

While it may not be altogether fair, without knowing more about the origin of the samples, to compare these wheats with those Queensland wheats tested by Mr. Brünnich in 1909, it may be stated that of forty-eight samples the average number of points gained was 83·3 in 100; in 1910, of fifty samples the average was 83·8; whereas these thirty New Zealand samples, it will be seen, give an average of 79·4.

PRACTICAL MILLING TESTS OF WHEAT GROWN IN NEW ZEALAND, SEASON 1911.

No.	Variety.	Locality.	Judging of Wheat by Points.							
			Appearance of Grain.	Weight per Bushel.	Ease of Milling.	Percentage of Flour.	Colour.	Gluten.	Strength.	Total.
			10	15	10	10	15	20	20	100
		<i>Maximum marks</i>	10	15	10	10	15	20	20	100
SOUTH ISLAND WHEATS.										
1	Imperial Tuscan ..	Royal Flour-mills, Timaru ..	8·0	13·0	9	6·5	12·5	17·5	16	82·5
2	Red Tuscan ..	" " ..	7·0	13·0	9	6·5	13·0	17·5	14	80·0
3	Solid straw Tuscan ..	" " ..	7·0	14·0	9	8·0	12·5	17·0	11	78·5
4	" ..	R. Hammond, Geraldine ..	6·0	12·0	9	7·0	13·0	6·5	18	81·5
5	Pearl ..	Royal Flour-mills, Timaru ..	8·5	13·0	8	6·5	13·0	16·0	17	82·0
6	White Pearl ..	" " ..	9·0	12·5	10	8·5	13·0	16·5	15	84·5
7	Velvet Chaff ..	Oamaru, Royal Flour-mills ..	7·0	12·5	9	8·0	12·5	18·0	18	85·0
8	" ..	South Canterbury Flour-mills ..	7·5	12·5	9	6·5	13·0	17·5	17	83·0
9	" ..	R. Hammond, Geraldine ..	8·0	12·5	9	6·5	13·0	17·0	19	85·0
10	Red Chaff ..	Royal Flour-mills, Timaru ..	5·5	12·5	10	6·5	12·5	17·0	14	78·0
11	" ..	R. Hammond, Geraldine ..	6·5	12·0	10	6·5	12·5	16·5	16	80·0
12	Pearl ..	" " ..	7·0	12·0	9	8·5	12·5	16·0	18	83·0
13	Bodier ..	Royal Flour-mills, Timaru ..	7·5	13·0	9	6·5	12·5	17·5	14	80·0
14	" ..	R. Hammond, Geraldine ..	6·0	11·5	9	7·0	12·5	16·5	15	77·5
15	Red Marvel ..	" Te Moana ..	5·5	12·0	10	7·0	12·5	16·0	16	79·0
16	" (new variety) ..	K. McKenzie, Geraldine ..	6·0	12·0	10	7·0	12·5	17·0	16	80·5
17	White Marvel ..	" " ..	6·5	10·5	9	7·0	13·0	16·5	14	76·5
18	Treasure (new variety) ..	" " ..	7·0	12·0	10	7·0	13·5	15·5	16	81·0
NORTH ISLAND WHEATS.										
19	Federation ..	D. Fraser ..	7·5	10·5	9	7·5	14·0	15·0	11	74·5
20	" ..	— Phillips ..	8·0	11·5	8	6·5	12·5	15·5	12	74·0
21	De Noe ..	R. Hammond ..	5·0	13·5	8	6·5	12·5	17·0	16	78·5
22	Comeback ..	R. Warriner, Greatford ..	8·5	15·0	8	6·0	12·5	16·5	17	83·5
23	Hard Straw Tuscan ..	Marton Junction plots ..	6·5	12·0	9	6·0	12·5	15·5	12	73·5
24	John Brown ..	H. Stantiall ..	7·0	13·5	9	7·0	12·5	15·5	13	77·5
25	Yandilla King ..	Plot 1 ..	7·5	12·0	10	6·5	13·0	14·0	15	78·0
26	Velvet Ear ..	Marton Junction plots ..	6·5	12·0	8	6·0	12·5	15·0	14	74·0
27	Jonathan ..	J. H. Perrett ..	8·0	14·0	6	6·0	13·0	16·5	17	80·5
28	Power's Fife ..	" " ..	9·5	14·0	6	6·5	13·5	17·5	18	85·0
29	Hunter's Wheat ..	Marton Junction plots ..	7·0	12·0	10	6·0	12·5	15·5	12	75·0
30	Grenadier ..	" " ..	3·0	10·0	10	6·0	12·5	15·0	14	70·5

MILLING NOTES.

No. 1. Grain medium to large, fairly well filled, uniform in type, medium texture; fairly good sample. Bran large, fairly clean; semolina soft, very clean. Easy to mill. Gluten coherent, elastic, very adhesive, soft, slightly dark colour.

No. 2. Grain medium-sized, fairly uniform, small portion shrivelled grain, otherwise sample well filled; very fair sample. Bran fairly large, fairly clean; semolina soft and very clean. Easy to mill. Gluten very adhesive, elastic, coherent, soft, slightly dark colour.

No. 3. Grain medium to large, fairly well filled, fairly uniform, shows portion of weathered grain and discoloured germ end, texture brittle and fairly hard; very fair sample. Bran fairly large and clean; semolina slightly gritty and clean. Easy to mill. Gluten coherent, elastic, very soft, adhesive, light colour.

No. 4. Grain medium to large, somewhat thin, fairly uniform, shows portion of grain slightly weathered, texture medium hard; fair sample. Bran large and clean; semolina slightly gritty and clean. Easy to mill. Gluten coherent, elastic, adhesive, soft, fairly dark colour.

No. 5. Short fairly plump grains, with slight admixture of foreign grain, texture medium hard; good sample. Bran large and fairly clean; semolina gritty and clean. Fairly easy to mill. Gluten elastic, coherent, adhesive, soft, fairly light colour.

No. 6. Long, large, well-filled grains, uniform and fairly even, texture medium; very good sample. Bran large and very clean; semolina soft and very clean. Very easy to mill. Gluten coherent, elastic, adhesive, soft, light colour.

No. 7. Short, somewhat shrunken grains, sample lacks uniformity, texture crisp and hard; very fair sample. Bran fairly small and very clean; semolina slightly gritty and clean. Easy to mill. Gluten very coherent, elastic, very adhesive, very soft, light colour.

No. 8. Short, fairly well filled medium-sized grains, sample shows portion of immature pinched grains, texture crisp and hard; very fair sample. Bran fairly small and clean; semolina slightly gritty, very clean. Easy to mill. Gluten elastic, very coherent, adhesive, very soft, light colour.

No. 9. Short plump medium-sized grains, sample shows portion of foreign grain, and signs of weathering, texture medium hard; fairly good sample. Bran fairly soft and clean; semolina gritty and fairly clean. Easy to mill. Gluten coherent, elastic, adhesive, very soft, light colour.

No. 10. Medium-sized, uneven grains, sample lacks uniformity, portion well filled, the other pinched and weathered, texture soft and inclined to be starchy; poor sample. Bran large and fairly clean; semolina soft and very clean. Very easy to mill. Gluten coherent, elastic, adhesive, soft, light colour.

No. 11. Short, medium-sized, fairly plump grains, sample weathered, and shows portion of damaged grain, texture soft and inclined to be starchy; fairly poor sample. Bran fairly large and clean; semolina soft and very clean. Very easy to mill. Gluten elastic, adhesive, coherent, soft, light colour.

No. 12. Short, well-filled grain, sample shows portion of foreign grain and lacks uniformity and is slightly weathered, texture medium hard; fair sample. Bran fairly large and very clean; semolina slightly gritty and very clean. Easy to mill. Gluten elastic, adhesive, soft, very light colour.

No. 13. Medium-sized, fairly plump, uniform grain, skin slightly shrivelled and dull, due probably to weathering, texture medium brittle; very fair sample. Bran large and clean; semolina soft and very clean. Easy to mill. Gluten coherent, elastic, adhesive, soft, light colour.

No. 14. Large, fairly plump, uniform grain, sample somewhat weathered, texture medium brittle; fair sample. Bran very large and clean; semolina fairly soft and very clean. Easy to mill. Gluten coherent, adhesive, soft, light colour.

No. 15. Medium-sized grain, with lack of plumpness and uniformity, shows distinct trace of weathering, texture medium soft; fairly poor sample. Bran large and very clean; semolina soft and very clean. Very easy to mill. Gluten very coherent, elastic, adhesive, soft, fairly dark colour.

No. 16. Large fairly well-filled grain, with deep and somewhat open crease. Sample shows trace of weathering, texture medium brittle; fairly poor sample. Bran very large and clean; semolina soft and very clean. Very easy to mill. Gluten coherent, elastic, soft, fairly light colour.

No. 17. Medium-sized grain, lacks uniformity, portion plump, balance slightly to badly shrivelled, sample badly threshed, shows portion of crushed and small light grain, considerably weathered, texture medium soft; fairly poor sample. Bran large and fairly clean; semolina soft and very clean. Easy to mill. Gluten coherent, elastic, adhesive, fairly soft, fairly dark colour.

No. 18. Medium-sized fairly plump grain. If small grains removed would dress to a very even sample, texture crisp; very fair sample. Bran fairly large and clean;

semolina soft and very clean. Very easy to mill. Gluten very coherent, elastic, soft, adhesive, fairly dark colour.

No. 19. Medium-sized plump fairly uniform grain, sample discoloured by weathering and is slightly bleached, texture soft; very fair sample. Bran fairly large and clean; semolina soft and clean. Easy to mill. Gluten elastic, fairly tough, fairly adhesive, fairly light colour.

No. 20. Medium-sized, fairly plump grain, uniform in type, texture soft and inclined to be starchy; fairly good sample. Bran fairly large and fairly clean; semolina slightly gritty and clean. Bran of this sample was very difficult to clean; fairly easy to mill. Gluten coherent very elastic, adhesive, very soft, light colour.

No. 21. Large rugged type of grain, not well filled, sample lacks uniformity, and is weathered, skin coarse and shrivelled, texture medium brittle; poor sample. Bran large, coarse, and fairly clean; semolina slightly gritty and clean. Fairly easy to mill. Gluten very coherent, very elastic, very adhesive, very soft, very light.

No. 22. Small, uniform, fairly even grain, skin bright and thin, texture medium hard; good sample. Bran fairly large and clean; semolina gritty and fairly clean. Fairly easy to mill. Gluten elastic, fairly coherent, adhesive, fairly tough, light.

No. 23. Medium-sized, fairly uniform grain, portion tip-weathered and discoloured germ end, texture crisp, medium hard; fairly poor sample. Bran fairly large and clean; semolina slightly gritty and very clean. Easy to mill. Gluten coherent, elastic, adhesive, soft, light colour.

No. 24. Long, moderately well filled and somewhat irregular grain, very deep crease, texture medium; very fair sample. Bran large and fairly clean; semolina soft and very clean. Easy to mill. Gluten adhesive, coherent, elastic, fairly tough, fairly dark.

No. 25. Large sized, fairly well filled, fairly uniform grain, sample slightly bleached, texture soft, starchy; very fair sample. Bran large and clean; semolina soft and very clean. Very easy to mill. Gluten elastic, adhesive, slightly coherent, fairly soft, fairly dark colour.

No. 26. Medium sized, moderately well filled, uniform grain, sample slightly weathered, discoloured at germ ends, texture crisp, not hard; fairly poor sample. Bran fairly large, coarse, and fairly clean; semolina soft and very clean. Fairly easy to mill. Gluten coherent, elastic, soft, fairly dark colour.

No. 27. Small, somewhat irregular grain, fairly uniform in type, texture fairly crisp and hard; fairly good sample. Bran small and clean; semolina gritty and very clean. Fairly hard to mill. Gluten elastic, fairly coherent, fairly adhesive, soft, fairly light colour.

No. 28. Small, uniform, even grain, texture crisp and hard; very good sample. Bran fairly small and clean; semolina slightly gritty and very clean. Fairly hard to mill. Gluten adhesive, elastic, coherent, soft, light colour.

No. 29. Small, fairly uniform, fairly well-filled grain; sample shows slight admixture of foreign grain, texture soft and starchy; very fair sample. Bran large, fairly coarse, fairly clean; semolina soft and very clean. Very easy to mill. Gluten coherent, elastic, adhesive, fairly tough, fairly dark colour.

No. 30. Medium-sized, deeply creased grain, sample lacks uniformity, and shows want of type, skin coarse and slightly shrivelled, texture soft and starchy; very poor sample. Bran fairly large, coarse and clean; semolina soft and very clean. Very easy to mill. Gluten coherent, elastic, adhesive, very soft, fairly light colour.

PERMANENT PASTURES.

EXPERIMENT ON THE LIGHTER PORTION OF "ELAND," THE PROPERTY OF MR. W. BRAMLEY, TAUPO ROAD.

G. DE. S. BAYLIS.

In the autumn of 1910 a large number of grasses were grouped into two mixtures, and each mixture sown upon a plot of 1 acre in extent. The particular land experimented with consists of light pumiceous sandy loam, reclaimed from fern and manuka scrub. The ordinary mixture commonly used—viz, that based chiefly upon perennial rye, cocksfoot, and clover—was thought to be most suitable to that class of country.

The idea in grouping the grasses was that mixture 2 should comprise several of the varieties of grasses and forage plants likely to prove suitable to the soil and climate, and that all stoloniferous grasses—viz, those spreading by means of a running underground stem—should be excluded therefrom.

Mixture 1 comprised grasses of somewhat rougher nature, and included some varieties of stoloniferous grasses. Neither mixture was advocated as the mixture to sow on that class of country. The mixtures were simply grouped for experimental purposes, with a view to striking out from the list those which failed, or which proved unsuited to the conditions therein prevailing.

Cultivation: The land was ploughed after clearing the fern and scrub, and summer-fallowed, to allow the roots to rot. Later it was reploughed, cultivated, and sown in March, the Cambridge roller being put over it in spring. The seed was broadcasted by hand, with about 1 cwt. superphosphate per acre.

Permanent pasture: The varieties tested comprised the following grasses: No. 1 mixture—*Danthonia*, 2½ lb.; *Chewing's fescue*, 2½ lb.; *florin*, 2½ lb.; *Poa pratensis*, 3 lb.; *Poa Brownii*, 1½ lb.; birdsfoot trefoil, 1½ lb.; *Lotus major*, 2 lb.; white clover, 2½ lb.; tall fescue, 10 lb.; *Paspalum dilatatum*, 2 lb.: total, 30 lb. No. 2 mixture—Cocksfoot, 5 lb.; dogstail, 1 lb.; *Bromus inermis*, 5 lb.; tall fescue, 10 lb.; meadow fescue, 5 lb.; *Chewing's fescue*, 1½ lb.; tall oat, 2 lb.; sheep's parsley, 2 lb.; burnet, 3 lb.; birdsfoot trefoil, 1 lb.; white clover, 2 lb.; cow-grass, 1 lb.; yarrow, 1 lb. (sown by mistake for ¼ lb.): total, 39½ lb. Unfortunately, immediately after sowing a very heavy wind-storm occurred, which caused the soil to drift considerably, especially on the points of spurs and exposed faces on plot 2, from which places much of the seed was removed.

Plot 2 (1st May, 1910): With the exception of *Bromus inermis* and meadow fescue, all the grasses sown appeared to be present in the pastures. Very plentiful—Tall fescue, burnet, yarrow. Plentiful—Cocksfoot, cow-grass, white clover. Evident—Sheep's parsley.

Plot 1 (1st May, 1910): Grasses sown making good progress, except *Lotus major*, which is not in evidence. The plots were grazed in June.

Again on the 23rd October, 1910, the plots were visited. Plot 2: Very plentiful—Tall fescue, burnet (in flower), yarrow, tall oat. Plentiful—Cocksfoot, cow-grass, white clover, birdsfoot trefoil, sheep's parsley. Evident—*Chewing's fescue*, dogstail.

Plot 1 (23rd October, 1910): Where a much better take had been secured most of the grasses appeared to be represented, and although at this date no *Paspalum*, *Lotus major*, or *Poa pratensis* had been identified, the sward on this plot was denser than on No. 2.

Plot 2 (12th July, 1911): *Bromus* and meadow fescue were not apparent in the sward, but other grasses were doing well—cocksfoot, tall fescue, and dogstail.

Plot 1 (12th July, 1911): No *Lotus major* could be found; *florin* was abundant, though somewhat affected by frost; tall fescue was very evident and doing well, while *Paspalum dilatatum* was discovered distributed in patches here and there, and very noticeable upon part of the sidling. Practically all the other grasses sown were in evidence.

Plot 1 (22nd October, 1911): Very plentiful—Tall fescue, *florin*, *Poa Brownii*, *danthonia*. Plentiful—Birdsfoot trefoil, white clover. Evident—*Chewing's fescue*, *Paspalum dilatatum*, *Poa pratensis*.

Plot 2 (22nd October, 1911): Very plentiful—Yarrow, tall fescue, tall oat, cocksfoot, burnet. Plentiful—Cow-grass, white clover, birdsfoot trefoil, sheep's parsley. Evident—Dogstail, *Chewing's fescue*.

31st January, 1912: On my visit on this occasion both plots, but especially plot 2, had been grazed very hard.

Plot 2: Very plentiful—Yarrow, sown by mistake in excess; burnet, now deeply rooted, is well established, and seems to like the dry knobs almost as well as the better places; tall fescue, now firmly established, appears to be well liked by the stock on this class of country, and throws good feed, rooting deep and abundantly; dogstail now abundant and well established; cocksfoot, with tall fescue, now ranks as the most prominent grass. Plentiful—Tall oat-grass, not quite so evident as earlier in the season; also cow-grass, birdsfoot trefoil, and white clover. Evident—*Chewing's fescue*, much of which got blown away after sowing; sheep's parsley, less conspicuous owing to the fondness sheep show for it, but is still present, probably in same proportion as formerly, is now flowering close to the ground, the seed-head being produced upon a short stalk, which suggests the possibility of this plant's ability to retain its footing in a sheep-pasture for a longer period than is usually estimated, even with close grazing. Apparently absent—*Bromus inermis* and meadow fescue.

Plot 1 (31st January, 1912): Very plentiful—*Danthonia*, tall fescue, and *Paspalum dilatatum* in those places where established; all these have been grazed close, *danthonia*

being apparently the one least appreciated of the three. Chewing's fescue doing well, and helping to fill in the bottom; foin forming a close sward. Plentiful—*Poa Brownii*, white clover, birdsfoot trefoil (now out of season). Evident—*Poa pratensis*. Apparently absent—*Lotus major*.

It is of interest to note that whereas in the early dates of the experiment some varieties, such as cocksfoot, dogstail, white clover, cow-grass, trefoil, sheep's parsley, and Chewing's fescue, were less conspicuous in the sward than some of the other varieties, such as tall fescue, burnet, tall oat, and the *Agrostis* family, still, when last visited on plot 2 cocksfoot and dogstail both rank with tall fescue and burnet as among the chief components of the sward, while Chewing's fescue, which on plot 1 (owing to more sheltered conditions after sowing having secured a better take) becomes an important factor in the composition of the sward, as does danthonia. *Paspalum dilatatum* is also late in making an appreciable appearance, but becomes an important factor when it has once obtained foothold. The establishment of all such grasses, together with most of the clovers, would have been very doubtful had a large quantity of perennial rye been sown in the mixture.

There are several facts to be borne in mind regarding the time which must elapse between the sowing down and the first grazing of permanent pastures. The poorer and colder the land to be dealt with, the longer the time needed for the grasses to get a sufficient hold to enable them to stand either the grazing or the treading of stock.

The pumiceous soils of the north, some of the better classes of which the experiment under observation to some extent resembles, while containing, in many instances, a fair amount of latent plant-food, are lacking in decomposing vegetable matter.

The use of stoloniferous grasses is a factor in the solution of this much-discussed problem. These grasses form a mat which completely hides the soil from sight. Such areas are extended by the creeping roots of the grasses in question as well as by the seed shed. The sod, when ploughed up, leaves an infinity of decaying vegetable matter so necessary to the increase of fertility in these soils. The soil is thus converted into one totally distinct from the original type to which it belonged when sown down, and is started upon the up grade, thus fitting it, in course of years, for the production both of crops and varieties of grasses which could not possibly be raised upon it when it was first taken in hand.

The remarks made by the experimenter are that both plots look like holding better than any of the usual mixtures sown, and that most feed has been given by No. 1 mixture.

§ 1. A small area on the frontage of this property (as I have already remarked) somewhat resembles some of the better classes of pumiceous soils found farther north, and for that reason this experiment is of considerable interest. The larger area on this property consists of land of greater fertility and of a different nature, and therefore the bulk of these remarks do not refer to that portion of the property, or to soils of that nature.

Confining attention therefore to the plots and their type of country, and having regard to the information gathered therefrom, it is suggested that a mixture somewhat of the following nature would be found suitable for the formation of a permanent pasture thereon: Cocksfoot, 5 lb.; danthonia, $\frac{1}{2}$ lb.; *Agrostis stolonifera*, 1 lb.; *Poa Brownii*, $\frac{1}{2}$ lb.; *Agrostis vulgaris*, 1 lb.; Chewing's fescue, 1 lb.; *Poa pratensis*, $\frac{1}{2}$ lb.; birdsfoot trefoil, $\frac{1}{2}$ lb.; white clover, 1 lb.; cow-grass, 2 lb.; tall fescue, 7 lb.; *Paspalum dilatatum*, $\frac{1}{2}$ lb.; dogstail, 1 lb.; burnet, 2 lb.; yarrow, $\frac{1}{2}$ lb.; sheep's parsley, 1 lb.; perennial rye, 2 lb.: total, 26 lb.

The approximate cost of such a mixture, even at the present high prices ruling, should not exceed 9½d. per pound. Such a pasture should only be grazed lightly for the first twelve months, and no stock should be run upon it until the component grasses had firmly established themselves. A sward so composed will become thicker and denser as it gets older, and both the carrying-capacity of the pasture and the fertility of the soil should increase in similar proportion.

Warning.—A word of warning is necessary regarding the use of tall fescue. The use of this grass is only advocated upon soils of the type here represented, and upon soils of a still poorer nature. Upon rich soils, swamp lands, or on medium soils situated in districts with very abundant rainfall, this grass should never be sown. Upon very thin soils with rock immediately underlying the surface it is unsuitable, as it is a deep-rooting grass. Its use is only advocated upon soils as herein described, and on soils of a very poor nature which do not lend themselves to the permanent establishment of the better grasses. Stock will readily consume it upon such soils and when associated with such grasses as are herein described.

ANSWERS TO CORRESPONDENTS.

SHEEP FEED.

"ORETE," Gisborne, writes,—

In a southern paper recently much stress was laid on mixed crops of maize and kale for sheep-feeding—carrying as much as sixty-five lambs to the acre for periods of some weeks. Would you please furnish me with some information as to—Class of land on which grown; previous crops; preparation of the soil; manures used, if any; time of sowing; time when fed off; method of feeding off—whether by fencing off in small sections; where dwarf-maize seed may be obtained.

The Fields and Experimental Farms Division replies,—

Not knowing the experience you refer to, the particulars cannot be furnished. Maize and rape would be a much better combination. The crop should be fenced off in small sections. The more it is fenced off the more stock it will carry. Say, 200 sheep are being fed, an acre would be about the right area to fence off at a time. Maize cannot be grown without risk of injury from frost before November. The maize and rape should be ready to feed off if planted in that month in about the middle of January. Any reliable seed firm should be able to supply seed of dwarf maize.

SHELTER TREES.

F. L., Koromatua, Frankton Junction, writes,—

My land is fern and tea-tree country, situated near Frankton Junction. I have two or three faces too steep for ploughing, and have thought that the best I could do would be to plant shelter and ornamental trees. Would you kindly advise me as to what would be the most suitable trees, combining utility and beauty. There would, I presume, be no disadvantage, in such a case, in the trees having large spreading roots, seeing that the land would never be ploughed.

I should also like to know what trees would be most suitable for shelter round the homestead.

The Orchards, Gardens, and Apiaries Division replies,—

Sequoia sempervirens (California evergreen redwood), *Acacia decurrens* (black wattle), *Eucalyptus amygdalina* (peppermint gum), *Pinus muricata*, *Acacia decurrens* would provide a quick-growing useful shelter for the homestead.

RAGWORT.

"RAGWORT," Hukanui, writes,—

I have just taken a farm here. The bush has not been down more than twelve years, and there is tutu and rangiora sparsely. One of my cows died after three days' illness. She had been in milk since the spring (right up to the time of attack), and was in splendid condition—fat and sleek. She suddenly ceased to give milk; her sides heaved, and her eyes were quite sunken. She continued like this for three days and died. Would tutu, rangiora, or ragwort have made her ill? Please state in your *Journal* what are the symptoms of poisoning from these plants, and give their remedy.

The Director of the Live-stock and Meat Division replies,—

With regard to your cow, it is difficult to give you any opinion as to what caused her death owing to the meagre description given of the symptoms shown, and also to the fact that apparently no *post-mortem* examination was made in order to determine what abnormal conditions of the internal organs were present. From the

description furnished I do not consider that either of the plants you mention caused death, although it was probably due to some digestive trouble.

Regarding symptoms and treatment of poisoning by tutu, rangiora, and ragwort: A note on the symptoms and treatment of tutu (*Coriaria ruscifolia*) appeared in "Answers to Correspondents" in last November's issue of the *Journal*, folio 434. Two bulletins recording the researches of Professor Easterfield and Mr. B. C. Aston, Analytical Chemists, on the tutu-plant are in print, copies of these are being posted to you.

Poisoning by rangiora is not well authenticated, though there is a widespread belief that the plant is poisonous, at any rate to horses. There are two varieties of this plant—*Brachyglottis rangiora* and *B. rependa*. They are very much alike, and no doubt have similar properties. There is comparatively little literature concerning rangiora, and it is proposed to carry out an investigation regarding it. From what can be gathered, its effects upon horses are said to be great excitability, staggering gait, weakness of the limbs, &c., the animal often falling. Fatal cases show the abdomen to be greatly distended with gas. No treatment of any reliability has been advocated. There is always the possibility, however, of other conditions being the real cause of illness or death, and it is not sufficient to assume that because an animal dies or is taken ill when turned out on places where the plant is abundant that death is due to eating it.

Ragwort (*Senecio Jacobaea*) may be eaten with impunity for quite a long time without any ill effects being noticed. Sheep are often placed in paddocks where it is plentiful to keep it down, and if not kept on too long apparently take no harm. It is not advisable, however, that the eradication of this noxious weed should be attempted in this manner. The animals which seem most susceptible to its ill effects are horses and cattle, and it has been practically proved that ragwort is the cause of the so-called "Winton" disease. The continual ingestion of the plant apparently has a very marked action upon the liver, causing this important organ's function to be considerably impaired, with consequent loss of health. Professor Gilruth, whose investigations we are practically dependent upon for our present knowledge on the subject, advocated a treatment in which nerve and liver stimulants were employed with considerable success. It must, however, be remembered that once the liver-structure is sufficiently extensively impaired permanent recovery cannot take place.

PRESERVED FRUIT.

"SCOTTIE," Eltham, writes,—

Could you, through your answers to correspondents, explain what is wrong with the preserved fruit that turns black in the jars, but is all right otherwise. I have tried pears in four different ways, and have had no success with them. My other preserves are as good as when done. My neighbours are complaining of the same thing.

The Director of Orchards, Gardens, and Apiaries replies,—

It is difficult to say what is wrong with the preserved fruit without examination. If a jar can be sent here an investigation will be made.

TRANSFER OF BEES.

MR. L. J. WEST, Springfield, Canterbury, writes,—

Would you please inform me through the columns of your *Journal* the best way to transfer a colony of bees from an ordinary box to a frame hive.

The Director of Orchards, Gardens, and Apiaries replies,—

The reply to this appears on page 206 of the Departmental *Journal* for March.

GARDEN PEA.

H. T. B., Nelson, writes,—

Will you please inform me, through your *Journal*, as to the earliest and best dwarf market garden pea to grow, say, in a climate like Nelson, and sown in late autumn

(it is of course understood that soil and climate are suitable), yield being secondary compared with money value. Around here nearly all growers use Stratagems; but I understand this to be a second early pea, and, for instance, American Wonder appears to be earlier and bears quite as many pods, but are so much smaller that it is questionable whether its money value equals Stratagems. Could your Department advise as to the kinds to experiment with in this direction.

The Orchards, Gardens, and Apiaries Division replies,—

Daybreak and Carter's Springtide are considered worthy of trial.

WASTE CARBIDE.—SALTING BUTTER.

W. W. C., Cashmere, Christchurch, writes,—

Can you inform me through your *Journal* whether the waste carbide from an acetylene-gas plant has any manurial value; and also of a good brine in which to preserve butter for the winter?

The Fields and Experimental Farms Division replies,—

The refuse from the manufacture of acetylene gas is practically slaked lime and may be applied for the same purposes as the latter.

The Dairy Produce Division replies,—

With reference to the above, *re* brine-salting of butter, this method of preserving butter is now rarely used. If, for instance, 1 oz. of salt per pound of butter is added, about 3 per cent. of salt will remain in the butter after it has been worked and packed; while, on the other hand, if brine is used for salting, only about 2 per cent. of salt will remain in the finished butter. If it is desired to use brine, it should be prepared beforehand by dissolving as much salt in warm water as it will retain. After churning the butter in the granular form, and washing it once with clean cold water, it can then be washed with the brine, which should be allowed to remain on the butter for five or six minutes, and then drawn off. The butter should then be again washed in the brine, which should be allowed to remain on it for a similar time. The same brine can be used on both occasions, provided additional salt is added to it. After the brine is run off the second time the butter should be worked in the ordinary way.

DISEASED OATS.—PRAIRIE-GRASS.

MR. JAMES RITCHIE, "Blyth," Nightcaps, Southland, writes,—

I have some dun oats badly infested with rust. Please state in your "Answers to Correspondents" if rusty chaff is bad for horses.

Is prairie-grass a good grass for sheep? Please state where seed can be procured and also price and quantity required per acre.

The Live-stock and Meat Division replies,—

Yes. Any damaged food is bad for horses, and should not be fed to them or to other animals. Feed damaged by such moulds as "rust" or "smut" has its nutritive qualities destroyed or depreciated, and its value as a food loses accordingly. Also, it is liable, if eaten in any quantity, to produce certain poisonous substances which seriously affect the animal, and might even in certain cases cause death.

The Fields and Experimental Farms Division replies,—

Prairie-grass seed is obtainable from almost all seed-merchants. Present quotation is from 3d. to 4d. per pound. It is a large seed, and if sown alone requires about 50 lb. per acre. Prairie-grass is particularly appreciated by all stock.

MANURE.

H. BANTON, Mauku, Pukekohe, writes,—

Can you advise me as to the best manure to apply as a top-dressing to improve the growth of grasses such as cocksfoot and perennial rye-grass? I have been using basic

slag mostly, with good results to the clovers, but the true grasses are not doing as they should. The cocksfoot looks light in colour and yellow at the tips. The soil is a stiffish clay loam that has been somewhat overcropped.

The Chief Agricultural Chemist replies,—

Basic slag is the best top-dressing for most northern pastures. Its application, however, often results in the stimulating of the clovers to such an extent as to crowd out the grasses. After a few years the clovers diminish in quantity and leave the soil in a much better condition for the growth of grasses by reason of the added humus and nitrogen. If enough slag has been applied—*i.e.*, from 6 cwt. to 10 cwt. per acre—I should advise you to wait a couple of seasons.

TOP-DRESSING.

“Bonedust,” Hukanui, writes,—

Kindly inform me through the columns of the *Journal* whether bonedust used as a top dressing for pasture is likely to carry any infectious disease to stock, and if the New Zealand bonedust is likely to be any better than the imported article.

Do you think the above manure better than basic slag for top-dressing the light soil of this district. Our land has all been heavy bush, and is rather stony.

The Live-stock and Meat Division replies,—

Bonedust is not now likely to carry any infectious disease to stock when used on pastures.

The Agricultural Chemist replies,—

There is very little difference in the composition of steamed bonedust on sale in New Zealand, whether the dust comes from Calcutta, Sydney, or is of local production. The local unsteamed bonedust is about $\frac{1}{2}$ per cent. (0.5 per cent.) higher in nitrogen, but there is very little of this available for sale. Both basic slag and superphosphate would probably be better than bonedust as a top-dressing for the pasture of your district.

Agriculture is the bedrock of all permanent basic success in a nation. Failure never occurs in agriculture provided the man has the necessary scientific knowledge backed up by a sufficiency of capital, permeated by a virile energy, and moulded by concentration of purpose. Like all other pursuits in which success is spelt a man must above all love his occupation, and work at it, so to speak, with his whole heart and soul.—*James Halse, in the Sudneu Stock and Station Journal.*

In Russia the Government and public institutions are now giving the peasant effective help. By being freed from the village community he gains the incentive of the private ownership of his land, and the Peasants' Agrarian Bank helps him to purchase land to be worked as an independent small farmstead: the co-operative and credit associations give him the credit necessary to purchase seed, cattle, implements, and, lastly, the introduction of better agricultural machinery and improved methods of agriculture all help him forward. Seed-cleaning and sorting machines are supplied to villages on hire.—*Bulletin of the International Institute of Agriculture.*

WEATHER AND CROPS.

APRIL.

OFFICERS of the Fields and Experimental Farms Division of the Department report as follows on the condition of the pastures and crops during the past month :—

BAY OF ISLANDS.—The weather in April was not of the most pleasant and agreeable description. For the first nine days it was humid and sultry, but it favoured the growth of grass. A total of 3·67 in. of rain fell up to the 27th, the heaviest fall being on the 2nd, when a downpour of 1·84 in. saturated the earth. Some very high winds have prevailed. While writing, a bitter gale with rain is raging from the north-west. Supplies at the butter-factories are growing small.—*W. J. Dunlop.*

OPOTIKI.—The weather during the early part of April was warm, seasonable weather, but in the latter portion of the month there were a few boisterous days with high winds and heavy rain. The pastures throughout the district are looking well, and stock in most instances are in good condition to start the winter. Maize is doing well, and with absence of frosts some fair crops are expected. Turnips throughout the district are looking better than they have for years.—*John Case.*

TE KUITI.—Another month with an excessive rainfall has been experienced, with a tendency during the latter part of the period to very cold weather, accompanied by strong winds. Pastures have fared well, showing fair growth, but during the latter part of the month have had a watery appearance. Root crops and green feed are looking exceedingly well. Autumn tilling is being delayed through the unsettled state of the weather.—*B. Bayly.*

NEW PLYMOUTH.—During the first week we had some fine sunny days, but at Easter the rain again set in, and has continued to the end of the month. The last week has been very rough, heavy rain being accompanied with cold wind and hail. The Mountain has a heavy coating of snow, and it appears as if winter has set in in earnest. Grass is plentiful, but the milk-supply is falling fast. In consequence of the wet season ploughing and other farm-work is progressing slowly. Those crops that are sown are making fair growth.—*R. E. Fairfax-Cholmeley.*

STRATFORD.—There was a variety of weather in April—several warm days, very heavy rains, and towards the end of the month cold weather and hailstorms, which caused the milk-supply to diminish.—*Austin F. Wilson.*

HAWERA.—Moderately fine weather prevailed during the early part of April. Good rain fell on the 9th, followed by a further spell of nice mild weather up to the 23rd, when heavy rain set in and continued for several days, over 2 in. falling on the 23rd and 24th. Since then to the end of the month the weather was extremely rough and unpleasant—continuous high winds from the south-west with bitterly cold atmosphere and recurring heavy showers of rain and hail. Present conditions indicate that very little more mild weather can be expected for the remainder of the season. The cold “snap” has resulted in a rapid falling-off in milk-supply at factories, and some creameries will be running only every other day after the 1st May. Stock, however, are in good condition, and, judging by present appearance of pastures, should winter well. Most farmers, too, are well provided with extra winter feed in both hay and roots.—*A. J. Glasson.*

WANGANUI.—Excellent weather was experienced for the first three weeks in April, including considerable sunshine and several good warm rains. The temperature ranged from mild to fairly high. From the 23rd to the end of the month heavy rains, with occasional tempests of hail, fell at frequent intervals, and the temperature was decidedly wintry. The barometer continues low, with an upward tendency. Pastures and crops—root and green—are looking well.—*C. Watson.*

OROUA.—The weather was changeable during the whole month. There was not an excessive rainfall, but cold winds, with an occasional frost, were general throughout

the Oroua, Manawatu, Rangitikei, and Kiwitea districts. Many farmers have arrived at the conclusion that it does not pay to grow rushes. They are therefore busy stumping and clearing their land in readiness for the plough.—*William Dibble*.

PALMERSTON NORTH.—The weather during the month of April was very unsettled, with a total rainfall of 4·7 in. The maximum rainfall for twenty-four hours was 1·1 in. on the 27th. Pastures are still good. Dairy-farmers have had a good season, and the prospects are good. Late crops have been very satisfactory. Some very good oat-yields have been recorded, such as 70, 80, 90, and 100 bushels per acre. The broken weather has been very much against grass-seed harvesting, and as a consequence a good deal of the seed is discoloured.—*W. Dalgliesh*.

HASTINGS.—We had a splendid rain in April, followed by congenial warm weather. In consequence, we had a growth of pasture almost equal to spring. On the 27th instant there was a cold snap, and the following day the ranges were covered with snow.—*J. G. Parker*.

WAIPIKURAU.—April was a good month for pastures and root crops. Though we have had several sharp frosts, the pastures are still making fair growth, nice warm weather following the frosts. There were several days' rain during the month.—*H. O. M. Christie*.

MANGAWEKA.—During the early part of April mild weather was experienced, with a good deal of sunshine. Latterly very wintry weather was experienced. This will have a telling effect on pastures. Some very fine crops of turnips are to be seen on the new burns—a valuable asset to farmers for the winter months.—*J. A. Melrose*.

MASTERTON.—The weather for the past fortnight has been most unfavourable for both stock and pastures. With the recent stormy weather and the amount of rain that fell throughout the summer the grass has jumped ahead, and consequently is soft. When the frosts appear the grass will crumble up. Dairy-farmers, I notice, are going in for more winter feed.—*J. S. Rankin*.

SOUTH WAIRARAPA.—The weather during April was very changeable. In the early part of the month it was fine and warm, but after Easter floods were experienced inland. Fine weather then set in, lasting for a couple of weeks, but the past few days have been very boisterous, with high winds from the south.—*S. C. Ivens*.

MARLBOROUGH.—In the Sounds, Kaituna, Pelorus, and Rai portions of the district good rains have fallen during the month, and the country generally looks well; but over the remainder of the district no rain fell until the 25th instant, when heavy showers set in, accompanied by snow on the higher altitudes and very much colder weather. The dry spell gave a set-back to pastures, and delayed farmers in ploughing, owing to the hardness of the ground. Frosts and generally wintry weather have now set in.—*F. H. Brittain*.

WESTLAND.—April was cold and wet, and a good deal of snow fell on the high country. The rainfall registered to date (27th) is 9·71 in. There were sixteen wet days, the maximum rainfall being on the 13th, 1·62 in. Considering the exceptionally cold and wet summer stock look remarkably well, and at the present time there is still plenty of green feed, but it is of a somewhat watery nature. The heavy bush on the West Coast is a great help to cattle through the severe winter months, acting as a good shelter. Birdsfoot trefoil (*Lotus major*) seems to be spreading rapidly in all parts of my district, the wet climate suiting its growth. I understand it has only been noticeable on the West Coast for the last four years, but it is spreading exceedingly fast. It is to be seen on poor land as well as on the better class of country.—*J. H. Walton*.

KAIKOURA.—The weather has been fairly good throughout the month, except on a few days of the last week, which were cold and stormy, with heavy rain and snow on the high country. There has also been a fair amount of frost during the month. Pastures are still good, and making a wonderful growth. Potatoes show a good deal of blight, and are not yielding up to expectations. There are fairly good crops of turnips on the low country, but very poor on the higher country.—*Wm. S. Goodall*.

RANGIORA.—The weather was very fine in April until the 23rd, when it broke and rained very heavily on the plains, with heavy rains and snow on the high country. The rivers and creeks rose very rapidly on the other side of Porter's Pass. All the harvest is in on the plains, but I saw some oats out on Mount White and a little on the Rakaiia Gorge. The harvest has been fairly satisfactory, but would have been much better had there been less rain and more sunshine. The potatoes have turned out fairly well, as a rule, although some have rotted owing to so much wet. There is also more than an average number of small ones. The maize has all been cut down by the frost about

Sheffield, but elsewhere seems to have been all right. Forage plants have all done well. The farmers have had a hard time this season trying to keep the weeds down, and in some cases have given them best. I have never seen weeds such as spurrey, yarrow, fathen, cranesbill, and pimpernel so luxuriant.—*A. Hughes.*

ASHBURTON.—Good open weather was experienced during the month, interspersed with heavy rains. The total rainfall for the month was 4.16 in., as compared with 2.40 in. for April of 1911. There have been unusual heavy falls of snow in the back country, which will probably cause anxiety to the graziers who have recently taken up runs.—*C. Branigan.*

WAIMATE.—The month of April has been more seasonable than the previous months—more sunny days, accompanied by cold nights, and frosts being the rule. Towards its close heavy rain fell, with considerable snow on the high country. Pastures generally throughout the district are good, and stock look exceptionally well. The stacking of grain is now completed, and the opinion is common that the grain-yield will be quite up to expectations. Potatoes may not yield up to average, but some crops already dug have turned out well. Root crops generally are better than they have been for some seasons, and the same may be said of peas and beans. Maize has suffered owing to unsuitable weather, and only in more sheltered spots is success noticeable. With anything like an ordinary winter the prospects of those on the land are encouraging.—*F. A. Macdonald.*

TIMARU.—During April several heavy cold south-west rains were experienced, with snow on the hills. Ploughing is well under way for winter wheat, and, though winter appears to have started early, the ground is in good order for winter cropping.—*J. C. Huddleston.*

OAMARU.—April has been a splendid month, and the threshing has gone on without a hitch, heavy yields being the order of the day. Green crops, such as rape, turnips, and rye, are in abundance everywhere. Potato crops are turning out very well indeed, with very little blight. Prospects for the farmer and grazier never looked better, and all are jubilant.—*S. M. Taylor.*

FAIRLIE.—The weather was very favourable during the first half of the month. Since then it has been very changeable, and now it is very stormy and cold, with snow on the ranges. At Lake Tekapo 4 in. fell on the 28th. Another storm set in on the 29th, and the back country is white with snow. The snow coming as low down as Fairlie, there is every indication of an early and severe winter. Farmers are busy threshing, and heavy yields are reported everywhere. The grain is in good order. It is a good year for the farmer, stock fattening well, big yields of grain, and good prices for everything.—*W. B. Manning.*

DUNEDIN.—From the 1st to the 25th April the weather was bright and warm, with a touch of frost at nights. This good spell enabled farmers to get their crops harvested in good order. The weather at time of writing is cold and stormy, with occasional showers of snow. The turnip crop is disappointing. Mangolds, also, are light. Potatoes will be much below expectations.—*J. R. Renton.*

KUROW.—April has been a good month for the farmer in this district, although the weather has now broken, and we are experiencing very cold boisterous winds, with considerable snow on the high country. Potato-digging is in full swing, and the crops are turning out very well on the whole, being free from disease, although croppers complain about there being too many small tubers. Threshing is still going on, and crops of wheat, barley, and oats have threshed remarkably well. The runholders in the back country have made preparations for a severe winter. They have carted some hundreds of tons of hay from the railway to their homesteads.—*G. Reid.*

PALMERSTON SOUTH.—The weather was fine during the greater part of the month, but a cold snap set in at the end of the last week, and is still continuing. Threshing is in full swing, and the results are in most cases up to expectations. A fair quantity of stubble land has been ploughed, and autumn-sown oats are through the ground. Pastures are good. Both turnips and mangels have in many cases gone to seed.—*C. S. Dalgliesh.*

TAPANUI.—The weather continues very unsatisfactory, and harvesting is being carried on under very adverse conditions. A few crops have yet to be reaped, while much is still in stook. Mills are busy when the weather permits, and some very heavy yields of oats have been recorded, up to 100 bushels, while seventy and eighty are quite common. The wheat crop will probably not yield up to that anticipated earlier in the season, owing in many cases to the effects of frost, grub, and wheat black-mould. Farmers should study the history of black-mould in the last *Journal*. Turnips have not bulbed

satisfactorily, but in most cases there is an abundance of tops. Frosts have been prevalent; two very cold snaps were experienced on the 13th and 26th, with snow very low down.—*W. J. McCulloch.*

BALCLUTHA.—The weather for April was more like midwinter. Rain fell on eight days, the heaviest fall being on one day—40 points, when it was extremely cold, with a fall of snow well down on the ranges. Total for the month was 138 points. Winter feeding of stock is started all through the district. Still some wheat and oat crops to cut, a good area being in stook. Some of it has been in stock for two months. A large area of crop is very discoloured, and expectations are that there will be a lot of inferior grain. Potato crops are only digging fair—far below last season's yields. Turnip crops are only moderate, a large area having seeded. Late-sown crops are very backward. Mangel crops are poor.—*Hugh A. Munro.*

NASEBY.—April was a disappointing month, cold and frosty nights being experienced, with a few falls of snow on the higher levels. During this week we have had very cold snow and sleet showers. There are still some paddocks in stook, and a continuation of the present weather will pretty well spoil it. There has been no autumn heat this season, and at present there is every appearance of a hard winter. Stock is looking well.—*A. T. N. Simpson.*

PEMBROKE.—The weather-conditions during the greater part of April were almost perfect, but during the last few days it was very cold and stormy. A large amount of snow fell on the higher country. The winter outlook at present appears bright. Grass, and especially the winged thistles, are coming away well.—*J. A. Griffiths.*

LUMSDEN.—Very good weather ruled for the early part of April, and the majority of farmers have been able to secure their late harvest. On the 13th the weather broke, and we had a fall of 3 in. of snow on the low-lying places. Since then we have had several severe frosts, with bright sunny days. On the 26th the weather broke, and for the rest of the month was wet. Potatoes, though not all dug, promise a good yield. There are still a few odd patches of oats in stook, but the majority is safe under cover.—*W. S. S. Cantrell.*

QUEENSTOWN.—For the first fortnight during the month we had beautiful weather. Since then it has been of a broken description, with rain. During the last week it was very cold and wet, with continuous snow day after day round the high country. This month the weather has been suitable for the growth of root crops.—*A. Clarke.*

LAWRENCE.—The rainfall for April was 1.89 in. There was good weather for the greater part of the month, but from the 26th to the 30th it was very stormy. On the 28th 37 points of rain fell, with snow on the surrounding hills. Harvesting was very much delayed by the broken weather. There are a few crops to cut yet in some cases, and a large amount is standing in stook. This is getting very much discoloured, but if given favourable weather another fortnight would see the bulk in stack.—*R. Barron.*

CLYDE.—Good weather was experienced during the first part of this month, but the last week has been cold and stormy. Pastures are looking well, and the grain-yields are above the average. Mangels are good in most places, but the general average of turnip crops is only fair.—*Thos. N. Baxter.*

OWAKA.—The weather for the month was at the first excellent; in fact, it was the best weather we have had for the past twelve months, being very mild and very warm. As the month wore on it changed rapidly by beginning to blow heavily, and finishing up with very heavy and cold rain and sleet showers, with a good coating of snow on the tops. There are a few crops in this district still uncut. All the rest are pretty well in the stack, and in some places threshed.—*Thos. D. Urquhart.*

INVERCARGILL.—The weather for the month of April was wet and cold; indeed, we have had no warm days throughout the month. The pastures are now short, and green feed is eaten off. The turnip crop, though somewhat improved this last month, is light in a good many instances, owing to the exceptionally unseasonable weather throughout the summer and autumn. Great difficulty has been experienced in harvesting grain and grass-seed crops this year. Harvesting of the latter was prolonged owing to continuous rain and the absence of drying winds. The same applies to the harvesting of grain crops. The wheat in a good many cases is not threshing well, on account of damage done by early frosts. There has been a good growth of straw, and the crops promised really good returns till the frost affected them. There is still a considerable amount of oats in stook, although the bulk of the crop is stacked, and a fair amount of threshing done, the yields being up to the average. Potatoes promise poor returns. The rainfall for the month was 4.35 in., rain falling on sixteen days.—*J. R. Whyborn.*

THE FRUIT CROP.

OFFICERS of the Orchards, Gardens, and Apiaries Division report as follows on the condition of the fruit crops in April:—

WHANGAREI.—The weather has been cold and very changeable. Only later varieties of apples are now to be got off the trees. There has been a full crop of pip fruits this season, and the crop of stone fruit has been considerably above the average. Oranges are showing up well. There has been a fair quantity of fruit sent to cool storage.—*J. W. Collard.*

AUCKLAND NORTH.—The weather throughout the month was very unseasonable, with frequent showers—much colder than usual. Peaches are practically over. Prices are fair. The supply of apples is heavy, but prices are low. Pears are in fair supply, and prices are lower than usual. The crop of English plums is finished. The local supply of potatoes is over.—*W. C. Thompson.*

AUCKLAND SUBURBS.—The weather has been very changeable during the month. Prices have shown little advance, but are still low for apples. Rust has been very bad this season on plums and peaches, especially the former, where spraying has not been done. Trees badly attacked are now practically defoliated.—*W. R. L. Williams.*

AUCKLAND SOUTH.—April was a very wet month, boisterous rain falling almost every day during the latter half of the month. Stone fruits and most of the pears have been picked and sold, prices on the whole being below the average. Late apples are looking well, very few being blown off considering the amount of wind. A heavy crop will be gathered.—*N. R. Pierce.*

HAMILTON.—Very changeable weather was experienced throughout April, terminating in very heavy rainfalls and a low temperature. Apples and pears of very fair quality have come on to the market, and prices are somewhat firmer for good lines. The potato crop is practically all harvested, the yield being rather lighter than usual. Blight has been prevalent in a number of localities, and growers will need to be very careful in the selection of seed.—*T. E. Rodda.*

WANGANUI.—The prospects of an abundant crop of apples and pears is being realized. The fruit is finishing in excellent condition.—*W. G. Hyde.*

MANAWATU AND WAIRARAPA.—Unseasonable weather towards the end of the month stopped picking operations. Late varieties of apples and pears are showing up well, being quite up to expectations. Prices for apples and pears have only been fair during this month, owing to large quantities of fallen fruit coming on the market. Quite a few growers are wrapping their apples in paper this season for the first time.—*George Stratford.*

HASTINGS.—Picking is well advanced. There is an abundance of fruit on hand. Splendid crops of Doughertys are still to be gathered.—*J. A. Campbell.*

NELSON.—Fine weather was experienced in April. Growers are now busy picking late sorts. Sturmers and Epp's Seedling are badly affected with black-spot. Stone fruit is finished—few pears still to be gathered. Two thousand cases of apples were shipped to South America on the 30th.—*J. H. Thorp.*

DUNEDIN.—The main crops of apples and late pears are being harvested. Bitter-pit is said to be not so bad as last season. I attribute this to the reason that trees are gradually steadying down to fruiting habit, and are carrying heavier crops. A few late peaches are still coming forward. The pruning season has commenced, and growers are busy at work on their apricot-trees.—*W. T. Goodwin.*

The exportation of fruit from Victoria has practically finished for this season. The result has been that the original record estimate of 318,000 cases at the beginning of the season has not been reached. The total exports for the last five years is as follows: 1908, 82,000 cases; 1909, 181,000; 1910, 162,000 cases; 1911, 297,000 cases; 1912, 265,000.

HONEY PROSPECTS.

THE Director of Orchards, Gardens, and Apiaries Division has received the following reports on the honey-crop prospects from Apiary Instructors:—

AUCKLAND.—As previously reported, owing to the unseasonable weather experienced throughout the summer, many beekeepers only expected to obtain about half-crops; but even this low estimate has not been realized. Taking the average throughout the Auckland districts, I estimate the crop for the season 1911–12 to be little more than one-third of that obtained last season. Prices are good, and the quality is mostly first grade. Merchants are paying from 10s. 6d. to 11s. 6d. per dozen for 2 lb. tins of first-grade honey, and prices are likely to still further advance.—*G. V. Westbrooke.*

WELLINGTON.—The beekeepers in Taranaki, Wellington, and Hawke's Bay have, for this season, extracted all their surplus honey. The quality is good, and prices are above the average. The crop, however, is one of the smallest on record, due to the very boisterous weather experienced throughout the summer.—*F. A. Jacobsen.*

CHRISTCHURCH.—As reported last month, this season's honey crop has turned out to be a very light one. This is due to the inclement weather experienced right through the season. Good prices, however, are being obtained.—*E. G. Kenny.*

DUNEDIN.—It is expected that the price of honey will rule high this winter. Bulk honey is quoted at 4½d., with a likelihood of an advance.—*E. A. Earp.*

AGRICULTURAL-SHOW DATES.

THE WINTER FIXTURES.

- May 23–24. Clutha and Matau Winter Show, at Balclutha.
- June 4–7. Otago Winter Show, at Dunedin.
- June 4–8. Waikato Winter Show, at Hamilton.
- June 5–8. Taranaki Winter Show, at New Plymouth.
- June 12–15. Dominion Dairy Show, at Hawera.
- June 13–14. Ashburton Winter Show, at Ashburton.
- June 18–19. Southland Winter Show, at Invercargill.
- June 25–28. National Dairy Show, at Palmerston North.
- Aug. 12–17. National Agricultural Show of Queensland, at Brisbane.

Secretaries of rural show societies in general are requested to forward the dates of the shows of their organizations as soon as available, for notification in this *Journal*.

In Italy there exists about 1,500,000 acres of chestnut wood, with a minimum yield of 8 cwt. per acre, worth a minimum price of 4s. pe cwt. The demand for chestnut wood is becoming more and more pronounced in the furniture-making industry and for the manufacture of tannin.—*Bulletin of the International Institute of Agriculture.*

WEATHER FOR APRIL.

D. C. BATES.

THE month opened with fair weather and light and variable winds, but on the 7th increasing northerly winds changing to west gave place to strong southerlies on the 9th. The glass then rose above normal for about thirty-six hours, a westerly area of low pressure followed, bringing mild but unsettled weather until the evening of the 15th, when an increase in barometric pressure took place with colder weather. From the 19th to the close of the month the weather was extremely unsettled and stormy at times.

DISTRICT NOTES.

Chiefly from Telegraphic Reports.

District.

- 1, 2, 3. A boisterous and wet month, both the number of wet days and the total fall being considerably above the average, the rainfall as much as 50 per cent. in excess.
4. Precipitation mostly of a showery nature, but a heavy fall on the 23rd. The latter half of the month very cold with south-westerly winds prevailing. Hail fell on the last four days. About 25 per cent. in excess of the normal for the month.
5. Very heavy rain (over 4 in.) fell in coastal parts on the 23rd, bringing the monthly fall to over 50 per cent. in excess of the average; inland the fall was not so heavy, but above the average was recorded for the month.
6. Double the average rainfall, mostly falling in the latter half of the month, when boisterous conditions prevailed, the first week being mild and fine. Some frosts about the middle of the month, and snow fell on the higher levels during the last few days.
- 7, 8. Heavy rainfalls on the 14th and 23rd, otherwise fair weather with the exception of some squally weather towards the close of the month. Rainfall generally below the average.
- 9, 10. Rainfall slightly in excess of average, northerly and easterly winds prevailing with fair and mild weather for the first half, but strong southerly and westerly in the latter half of the month with damp and cold conditions.
11. Northwards of Westport this district had more than the average amount of rain, ranging from 20 per cent. to 45 per cent., but southward stations generally show a decrease, with the exception of a few isolated stations. Cloudy and showery weather from the 6th, and high westerlies accompanied with hail on 26th, 27th, and 28th. On these days snow fell on the hilly country. Generally rough weather from 22nd to the end of the month.
- 12, 13. Similar conditions to the above prevailed in these districts, though the rainfall generally was below the average.
14. This district reported about 27 per cent. below the average. Showery on the 6th, 7th, 8th, and 14th, the latter day with a strong southerly blowing. From the 23rd to the end of the month squally west to south winds; and during this period most of the rain recorded fell, the 23rd being the wettest with over an inch in most parts. With the exception of the above days, fair weather prevailed, and several frosts occurred during the month.

15. Rainfall about the average, the greater proportion falling from the 20th to the end of the month, when squally westerly winds prevailed, with snow on the hills at times. The first half of the month consisted of moderately fair weather interspersed with some showers, but a few places on the western boundary had a heavy fall on the 8th. Frosts reported on 17th.
16. The month opened with fine and mild weather until the 6th, after which colder conditions ruled and the higher country received some coatings of snow from the 24th to the end of the month. No heavy falls of rain during the month, and the rainfall was generally below the average.
17. More rain fell in the western than in the eastern half of this district, but the mean fall was not attained in any portion. Somewhat similar conditions prevailed as in 16.
18. In the whole of this district the rainfall exceeded the average, that portion about the Sounds by over 50 per cent., but the eastern and southern portions only slightly. The heaviest falls occurred about the 23rd, and from then until the end of the month squally and showery conditions were experienced, with winds frequently attaining the force of a gale. Periods of fair weather generally between 1st and 5th, the 9th and 13th, and the 18th and 21st. The first fortnight was mild.
19. The rainfall was above the average in this district, ranging from 20 to over 60 per cent., some portions receiving a very heavy fall on the 23rd. With the exception of the last week, fair weather ruled. A few moderate frosts were experienced, principally in the middle of the month. North-east and south-west winds predominated.
20. Rainfall 70 per cent. above the average. Weather similar to that in district 19.
21. From 40 to 50 per cent. above the average rainfall for the month of April. Weather similar to 19 and 20.
22. Rainfall about 30 per cent. above the average. More showery weather in this district than in those a little further north, but the fall on the 23rd was not so heavy.
23. Less rain fell in this district than is usual during April, the total fall being only about half the average. A few light showers fell before the 27th, otherwise this period consisted mainly of fair to fine weather. Towards the close of the month cold and squally conditions prevailed, and some heavy hail showers fell at times.
24. Rainfall generally considerably below the average, though a few places recorded but a slight deficit. Northerly and easterly winds prevailed during the first week with fair weather, after which westerly winds predominated, and cold and showery conditions were experienced.
25. Slightly below the average rainfall recorded in this district. From about the 9th to the end of the month strong westerly winds and generally boisterous and cold weather prevailed.

The export of wheat from the Commonwealth to the South American States—Peru and Chile—last year amounted to 1,243,310 centials, valued at £364,439. Of this amount Victoria contributed 605,233 centials; South Australia, 596,763 centials; and New South Wales, 40,314 centials.

The "Athenic," which sailed from New Zealand for London on the 20th April, loaded for Rio de Janeiro at Lyttelton 600 sacks of potatoes, 200 sacks of oats, 55 carcasses of mutton and 20 carcasses of lamb, and at Wellington 400 sacks of potatoes. The "Athenic" also carried the second shipment of the season of Tasmanian apples for South American ports, comprising 12,979 cases, 4,362 cases for Rio de Janeiro, and 8,616 cases for Monte Video.



COMMERCIAL REPORTS.

THE MEAT TRADE.

AUSTRALIAN FROZEN LAMB IN GERMANY.

WE find in the *Zeitschrift für die Gesamte Kalte Industrie* for February a statement by Mr. Kogler, slaughterhouse-manager, on the experimental importation of frozen meat into Chemnitz. This consisted of fifty-seven fat lambs of fine quality, weighing about 23 cwt. The lambs came *via* Bremen, where they arrived completely frozen, with various parts of the animals fully attached, as provided in the meat inspection law, and were inspected, according to which the permit to forward the meat to Chemnitz was given. It reached the town on Sunday, the 14th January, about 6 p.m., and was promptly put into the slaughterhouse cold-store at a temperature approaching freezing. The temperature was then raised to about 35° Fahr., so that the lambs should thaw gradually; and on the 16th the parcel was sampled, some having been taken out on the 15th and exposed to a temperature of 54° Fahr., under which it remained till the following morning, having thereby become thoroughly thawed. Some was put into cold water and then gradually boiled, some into boiling water, some was roasted at an open fire, and some cooked in an oven; and it was seen that the lamb put into hot water and that roasted in an oven were preferable to that boiled and roasted respectively by the other methods. Fifty people of various standing were invited to taste the lamb. All were pleased, and expressed themselves as certain that the merchandize would find a ready public. The meat was offered for sale in the open market under hygienic police inspection at from 6½d. to 7½d. per pound, and was readily bought; the buyers having once tasted it being quite ready to repeat their purchases. The writer thinks the German public, like the English, Austrian, and Swiss public, will at first only gradually take to the frozen meat, and he warns dealers against importing large quantities in the early stages. He does not believe that the importation of frozen meat will depress the price on the home market. It will simply widen the market. At the next experiment it is intended to distribute the frozen meat amongst a large number of shops.—*Ice and Cold Storage*, March, 1912.

VANCOUVER BUTTER MARKET.

THIS season must have been highly satisfactory to the exporters of butter in New Zealand, seeing they have secured such a hold on this market, over 30,000 boxes of butter having been imported to Vancouver. Several of the importers are now inquiring at what date it would be most suitable for them to arrive in the Dominion, so that they could arrange personally with exporters or dairy-factory directors for next season's requirements. . . . This has been a splendid season for New Zealand butter, and both the trade and the consuming public speak well of the quality.—*New Zealand Trade Commissioner*, Vancouver, 15th March, 1912.

The following shipments of produce were despatched from the Commonwealth to the United Kingdom during the month of March: Mutton, 104,063 carcasses; lamb, 57,313 carcasses; beef, 635,019 lb.; butter, 6,596,676 lb.; cheese, nil.

BRITISH PRODUCE IMPORTS.

THE QUANTITIES AND VALUE OF CERTAIN LINES OF PRODUCE IMPORTED INTO THE UNITED KINGDOM FROM ALL COUNTRIES DURING THE YEARS 1907, 1908, 1909, 1910, AND 1911.

Year.	Total Quantity Imported.	Value.	From Foreign and other Countries.		From New Zealand.	
			Quantity.	Value.	Quantity.	Value.

WOOL.						
	lb.	£	lb.	£	lb.	£
1907	759,237,245	32,693,011	600,830,990	25,035,998	158,406,255	7,657,013
1908	719,044,881	27,997,328	559,345,459	22,055,563	159,699,422	5,941,765
1909	803,432,548	31,886,375	626,975,398	24,850,944	176,457,150	6,935,431
1910	797,418,403	33,811,537	607,737,552	25,284,780	189,680,851	8,526,757
1911	795,091,310	33,001,622	620,970,681	25,525,611	174,120,629	7,476,011

MUTTON AND LAMB—FRESH AND REFRIGERATED.						
	Carcases.	£	Carcases.	£	Carcases.	£
1907	4,578,523	8,687,407	2,573,445	4,691,179	2,005,078	3,996,228
1908	4,385,771	8,140,029	2,648,165	4,687,445	1,737,606	3,452,584
1909	4,761,838	7,839,195	2,783,815	4,340,142	1,978,023	3,499,053
1910	5,405,923	9,802,858	3,301,750	5,564,685	2,104,173	4,238,173
1911	5,337,451	9,588,646	3,355,984	5,661,895	1,981,467	3,926,751

BEEF—CHILLED AND FROZEN.						
	Cwt.	£	Cwt.	£	Cwt.	£
1907	5,735,003	10,397,102	5,343,704	9,830,519	391,299	566,583
1908	5,631,989	10,308,380	5,284,117	9,766,780	347,872	541,600
1909	6,140,522	10,293,406	5,686,154	9,633,087	454,368	660,319
1910	7,015,498	11,745,146	6,482,668	10,947,611	532,830	797,535
1911	7,362,434	11,136,223	7,104,499	10,761,958	257,935	374,265

BUTTER.						
	Cwt.	£	Cwt.	£	Cwt.	£
1907	4,210,156	22,417,926	3,896,293	20,828,700	313,863	1,599,226
1908	4,211,195	24,082,537	3,989,800	22,832,326	221,395	1,250,211
1909	4,062,812	22,424,962	3,784,231	20,952,743	278,581	1,472,219
1910	4,325,539	24,493,450	3,962,865	22,492,057	362,674	2,001,393
1911	4,302,956	24,602,111	4,026,510	23,106,869	276,446	1,495,242

CHEESE.						
	Cwt.	£	Cwt.	£	Cwt.	£
1907	2,372,233	6,905,509	2,179,932	6,316,834	192,301	586,675
1908	2,306,086	6,684,203	2,041,091	5,883,072	264,995	801,131
1909	2,390,090	6,829,863	2,021,559	5,716,151	368,531	1,113,714
1910	2,456,340	6,809,876	2,002,555	5,499,326	453,785	1,310,550
1911	2,348,322	7,139,942	1,950,477	5,930,393	397,845	1,209,549

HEMP.						
	Tons.	£	Tons.	£	Tons.	£
1907	123,273	4,037,264	100,048	3,291,298	23,225	745,966
1908	111,524	2,949,648	96,057	2,539,113	15,467	410,535
1909	109,908	2,640,815	100,537	2,425,428	9,371	215,387
1910	124,003	3,031,495	106,656	2,605,762	17,347	425,733
1911	134,685	3,173,229	119,612	2,861,379	15,073	311,850

SHIPMENTS OF PRIMARY PRODUCE FROM NEW ZEALAND TO UNITED KINGDOM.
COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.	Mutton, Carcases.	Lamb, Carcases.	Beef, Quarters.	Butter, Boxes.	Cheese, Crates.	Wool, Bales.	Wheat, Sacks.	Oats, Sacks.	Rabbits, Crates.	Hemp, Bales.	Tow, Bales.	Kanri- gum, Cases.	Sundry.
January, 1912	237,284	302,399	12,424	114,512	64,005	95,994	..	.. 16	7,295	6,365	1,942	3,407	59 carcasses pork.
1911	175,337	287,120	13,368	90,405	46,375	127,199	..	..	399	15,234	3,302	7,624	590 "
February, 1912	208,424	273,246	13,052	101,544	62,398	106,074	607	..	..	6,831	1,615	1,056	..
1911	343,090	450,406	24,924	86,368	46,667	70,030	23,694	200	..	4,428	1,302	2,113	1,369 carcasses pork.
March, 1912	394,192	518,402	20,201	64,925	49,308	70,022	..	4,980	..	3,832	1,352	2,644	16 carcasses pork.
1911	264,497	665,822	26,657	45,912	40,668	58,362	40,276	..	..	3,650	1,583	8,982	2,408 "
April, 1912	213,178	355,829	7,046	38,986	38,137	31,615	4,905	2,180	..	5,134	1,958	4,458	..
1911	172,563	494,413	19,106	14,823	33,411	42,917	38,456	6	..	9,233	1,837	2,577	2,431 carcasses pork.
May, 1911	204,390	377,105	20,173	995	20,732	33,033	93,854	..	..	7,443	1,210	7,720	1,087 carcasses pork.
1910	310,196	622,232	38,276	9,588	28,384	25,123	81,052	..	3,010	10,017	2,346	3,150	1,293 "
June, 1911	214,079	448,432	15,789	..	6,323	19,568	39,422	..	14,128	4,763	525	5,528	2,434 carcasses pork
1910	299,596	555,777	60,286	485	17,963	21,260	13,707	..	8,988	6,180	2,684	7,104	658 "
July, 1911	306,869	260,761	14,296	..	276	14,100	23,452	..	10,334	6,022	1,073	2,786	175 carcasses pork.
1910	249,906	334,753	71,160	..	595	12,816	20,604	1,106	8,649	6,695	1,437	8,272	2,448 "
August, 1911	66,608	110,054	3,653	..	..	5,260	31,976	..	18,231	3,443	303	3,475	203 carcasses pork.
1910	94,468	97,899	16,440	634	..	5,381	33,970	273	22,629	1,378	720	6,793	362 "
September, 1911	102,081	40,057	6,059	6,404	..	7,390	38,151	..	33,059	5,604	393	7,672	220 carcasses pork.
1910	104,925	26,416	8,420	22,644	41	6,539	40,876	3,863	7,721	2,680	597	1,682	255 "
October, 1911	9,417	2,043	100	49,626	11,501	2,182	..	..	32,094	4,514	754	2,982	..
1910	49,010	800	10,531	60,014	9,159	3,189	94,815	23,330	36,947	3,632	1,232	3,089	56 carcasses pork.
November, 1911	47,770	10,427	403	135,741	57,319	44,934	15,893	..	16,606	7,844	2,183	3,085	..
1910	62,926	29,877	5,554	105,759	27,749	55,551	76,594	331	23,646	6,850	2,300	4,339	911 carcasses pork.
December, 1911	72,192	91,965	765	109,397	46,883	54,297	..	..	4,366	5,719	1,364	2,708	..
1910	82,405	157,172	13,155	182,051	67,162	59,080	..	..	9,716	4,524	109	5,363	686 carcasses pork.

HEMP AND TOW GRADING RETURNS.

APRIL, 1912.

Hemp.—The total number of bales graded was 9,169, as compared with 6,478 bales for the corresponding month of last year, an increase of 2,691 bales. For the twelve months ending 30th April, 1912, the number of bales graded was 88,375 as compared with 105,478 for the previous twelve months, the decrease being 17,103 bales.

Tow.—During the month 2,474 bales were dealt with, as compared with 1,590 for the corresponding month of last year, an increase of 884 bales.

HEMP AND TOW GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF APRIL, 1912.

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.	Common.	Rejected.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland	205	518	63	..	..	786
Napier	113	..	..	..	..	113
Foxton	2,086	1,806	55	..	..	3,947
Wellington	65	2,476	1,051	27	5	14	3,638
Blenheim
Pictou	78	27	119	..	..	..	224
Lyttelton
Dunedin	65	55	..	..	..	..	120
Bluff	77	259	5	..	..	341
Totals	208	5,039	3,753	150	5	14	9,169
Percentages of totals	..	2.27	54.96	40.93	1.64	0.05	0.15	1.00

Tow.

Port.	First Grade.	Second Grade	Third Grade.	Condemned.	Total
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	118	88	27	233
Napier ..	..	..	..	..	..
Foxton ..	304	614	14	..	932
Wellington ..	518	486	40	26	1,100
Blenheim ..	..	..	..	..	..
Pictou ..	35	..	50	..	85
Lyttelton ..	..	..	..	..	..
Dunedin ..	..	14	..	..	14
Bluff ..	..	70	38	2	110
Totals ..	887	1,302	230	55	2,474

Stripper-slips.—Wellington, passed for shipment 222, condemned 40; Bluff, passed for shipment 2: total 264.

STOCK EXPORTED.

APRIL, 1912.

THE following table shows the numbers and descriptions of stock exported from the Dominion :—

Port of Shipment.	Horses.			Cattle.		Sheep.		Swine.	
	To Australia.	To Pacific Islands.	To Singapore.	To Australia.	To Pacific Islands.	To Australia.	To Pacific Islands.	To India.	To Pacific Islands.
Auckland	41	16	..	..	43	..	121	..	42
Gisborne .. ..	..	..	..	..	..	..	..	..	..
Napier .. ..	..	..	..	..	..	..	..	..	..
Wellington	6	..	..	..	..	..	..	..	..
Lyttelton	24	..	..	..	..	..	..	..	..
Dunedin	4	..	..	..	..	..	..	..	..
Bluff .. ..	..	..	..	..	..	..	..	..	..
Totals	75	16	..	..	43	..	121	..	42

Following are particulars of the horses shipped : 63 draughts (8 stallions, 16 mares, 27 geldings, 1 colt, 11 fillies), 9 thoroughbreds (1 stallion, 2 mares, 3 geldings, 1 colt, 2 filly foals), 2 hackneys (1 mare, 1 gelding), 16 light horses (15 mares, 1 gelding), 1 trotting gelding.

ARGENTINE TRADE WITH EUROPE.

THE following particulars regarding the shipments of meat from the Argentine to European ports for the nine months ending December, 1911, have been supplied by the New Zealand Government correspondent at Buenos Aires :—

Port.				Beef, chilled.	Beef, frozen.	Mutton.	Lamb.
				Quarters.	Quarters.	Carcases.	Carcases.
Genoa .. ..	..	..	..	704	45,771	650	650
Trieste .. ..	..	..	..	8,465	56,683	2,760	900
Havre .. ..	..	..	..	..	6,000	2,000	..
Las Palmas .. ..	..	..	..	5,232	4,242	24,989	4,000
Other ports .. ..	..	..	..	..	1,626	..	..

AUSTRALIAN WHEAT STANDARD.

THE following are the F.A.Q. standards for wheat of the four exporting States of the Commonwealth for the 1911-12 and 1910-11 seasons :—

				1911-12.	1910-11.
				lb.	lb.
New South Wales .. ..	..	..	..	61½	62½
Victoria .. ..	..	..	..	61½	62½
South Australia .. ..	..	..	..	61½	62½
Western Australia .. ..	..	..	..	62	..

STOCK IN QUARANTINE.

THE following stock was received into quarantine during the month of April:—

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
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MOTUIHI ISLAND (AUCKLAND).

24	Romney	.. Ewes	} London	{ E. Mitchelson and Co.	Auckland.
1	"	.. Ram			
1	Holstein	.. Cow	} Sydney	.. G. T. Niccol	"
1	Holstein calf	..			
1	Holstein	.. Bull	"	Loan and Mercantile Company	"

SOMES ISLAND (WELLINGTON).

1	Polled Angus	Bull	.. London	.. W. J. Birch	.. Marton.
2	Devon	.. Heifers	.. "	.. "	.. "
1	Romney	.. Ram	.. "	.. "	.. "
1	"	.. Ewe	.. "	.. "	.. "
1	Polled Angus	Bull	.. "	.. H. B. Williams	.. Poverty Bay.
1	Cocker spaniel	Dog	.. "	.. S. Crisp	.. Nelson.
1	Pomeranian	"	} "	Miss E. Humphries	Auckland.
1	"	Bitch			
1	Scotch bearded collie	Dog	.. "	.. W. MacLaren	.. Masterton.
1	Hereford	.. Bull	.. Sydney	.. G. N. Currie	.. Kai Iwi.

QUAIL ISLAND (LYTELTON).

2	Collie	.. Dogs	.. London	.. Mr. Lumsden	.. Palmerston S.
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PRODUCE IMPORTED.

THE following return, compiled by the Customs Department, shows the total importations into New Zealand during the month of April of agricultural and farm products:—

Item.					Quantity.	Value.
						£
Bran	..	..	..	..	tons	..
Butter	..	..	..	..	cwt.	..
Cheese	..	..	..	..	2 cwt.	12
Chaff	..	..	..	..	ton	..
Fruits, fresh, all kinds	..	..	..	..	810,863 lb.	6,915
Barley	..	..	..	..	centals	..
Oats	..	..	..	..	centals	..
Wheat	..	..	..	..	centals	..
Onions	..	..	..	..	105 cwt.	45
Pollard and sharps	..	..	..	..	5 tons	25
Potatoes	..	..	..	..	tons	..
Seeds, grass and clover	..	..	..	..	650 cwt.	2,690
Total values imported					..	£9,687

THE BRITISH PRODUCE-MARKET.

HIGH COMMISSIONER'S CABLED MARKET REPORTS.

THE Department has received the following cablegrams from the High Commissioner for New Zealand. (NOTE.—Quotations, unless otherwise specified, are average market prices on spot.)

London, 13th April, 1912.

Mutton.—The market is quiet, but steady. Light weights are reported to be in small supply. Canterbury are not quoted, but the average price is nominally 4½d. per lb. North Island, 4d. per lb. for light weights, for heavy weights 3¾d. per lb.

Lamb.—The market is firm; there is a good demand for all lamb. Canterbury, 5¾d. per lb.; other than Canterbury, 5¾d. per lb.

Beef.—The market is firm. There is a better demand for beef. New Zealand hinds, 4½d. per lb.; fores, 3¾d. per lb.

Butter.—The market is dull. There is less demand, but holders are disposed to meet buyers. The average price for the week for choicest New Zealand butter, per cwt., is 121s.; Australian, 117s.; Argentina, 116s.; Danish, 128s.; Siberian, 117s.

Cheese.—There is a good demand. The average price for the week for finest New Zealand cheese, per cwt., is 73s. 6d.

Hemp.—The market is very quiet; nothing doing. Spot—New Zealand good-fair grade, £21 10s., fair grade £20, fair current Manila £21, per ton. Forward shipment: New Zealand good-fair grade £20 12s. 6d., fair grade £20 5s., fair current Manila £21 10s., per ton. The output from Manila for the week was 26,000 bales. Stock of New Zealand hemp, 289 tons.

Kauri-gum.—The market is steadier. Dark-brown selected rescraped, £6 to £8; dark-brown three-quarter-scraped, 83s. to 95s.; dark-brown chips drossy, 30s. to 40s.; rescraped pale amber, £10 to £12; three-quarter pale scraped, £8 to £8 10s.; diggers' chips good, 45s. to 50s., per cwt. 220 cases offered, 75 cases sold; stock, 519 tons.

Wheat.—The market is firm, with an improved demand.

Oats.—The market is firm.

Peas.—The market is quiet; the demand is getting better.

Beans.—The market is steady, and holders are firm.

Cocksfoot-seed.—The market is quiet. Buyers are not keen to do business in cocksfoot-seed.

Mutton and Lamb.—River Plate shipments received during March, 1912:—

				Mutton. Carcases.	Lamb. Carcases.
London	..	..	..	31,601	37,292
Liverpool	..	..	..	193,689	29,694
Hull	..	..	..	11,138	1,363
Newcastle	..	..	..	8,246	1,383
Cardiff	..	..	..	6,350	1,000
				271,024	70,602
March, 1911	..	..	..	210,846	40,264

London, 20th April, 1912.

Mutton.—The market is quiet, but firm. Heavy weights are difficult to sell at an average price of 3½d. per lb. A good demand continues for lighter carcasses, selling at an average price of 4d. per lb. Ewes, 3¾d. per lb.

Lamb.—The market is steady, with a very good demand. Prices are firm at the last rates quoted: Canterbury 5¾d., other than Canterbury, 5¾d. per lb.

Beef.—The market remains firm. A small supply and a good demand continues: New Zealand hinds 4½d., fores 3¾d., per lb.

Butter.—The market is very depressed. Buyers of butter are holding back, expecting prices to go lower. A large decrease in consumption is reported on account of high prices and labour troubles recently. The average price for the week for choicest New Zealand butter per cwt. is 114s.; Australian, 112s.; Argentina, 110s.; Danish, 126s.; Siberian, 112s.

Cheese.—The market is quiet, prices slightly weaker. Stock is moderate. The average price for the week for finest New Zealand cheese, per cwt., is 72s.

Hemp.—The market steady, but no demand. New Zealand good-fair grade, per ton, £21 10s. to £21 15s.; New Zealand fair grade, per ton, £20 for any positions; for Manila the market is firmer. Fair current Manila spot per ton, £21 10s. Forward shipment, £21 15s. The output from Manila for the week was 24,000 bales.

Wool.—The market, quiet, but steady. Current quotations for Bradford tops: 36's, low crossbreds, 1s. 1d.; 40's, low crossbreds, 1s. 1½d.; 44's, medium crossbreds, 1s. 2d.; 50's, halfbreds, 1s. 5½d.; 56's, quarterbreds, 1s. 7½d.; 60's, merinos, 2s. 0½d.;

Hops.—The market is firm, with improved demand. No change in prices: English £13, Californian £12, per cwt.

London, 27th April, 1912.

Mutton.—The market is quiet, and prices are slightly weaker. Nominal quotations: Canterbury, 4½d. per lb.; North Island light weight, 3¾d. per lb.; heavy weight, 3½d.

Lamb.—The market is firm. There is a good demand for all lamb. Canterbury, 5¾d. per lb.; other than Canterbury, 5½d. per lb.

Beef.—The market is firm. Stocks of New Zealand beef on hand are light. New Zealand hinds 4½d., fores, 3¾d., per lb.

Butter.—The market is dull and unsettled, but lower prices are encouraging business. The average price for the week for choicest New Zealand butter, per cwt., is 109s.; Australian, 105s.; Argentina, 105s.; Danish, 119s.; Siberian, 107s.

Cheese.—The market is slightly weaker, with less demand. The average price for the week for finest New Zealand cheese per cwt. is 70s.

Hemp.—The market is quiet, but steady. New Zealand quotations are unchanged, viz.: All positions. Good-fair grade, £21 10s. to £21 15s.; fair grade, £20 per ton. The market is firmer for Manila. Fair current Manila, spot, per ton, is £21 15s. Forward shipment, £22. The output from Manila for the week was 24,000 bales.

Wool.—The market remains firm.

London, 4th May, 1912.

Mutton.—The market is quiet, but steady. Light weights continue scarce, and command premium prices. Canterbury are not quoted, officially; the prices are about the same as last week—viz., Canterbury 4½d., North Island light weights 3¾d., heavy weights 3½d., per lb.

Lamb.—The market is very firm. There is a general and active demand. Shipments are now clearing as soon as they arrive. Future prospects are good. Canterbury 5¾d., other than Canterbury 5½d., Plate 5½d., per lb.

Beef.—The market is firm; a good demand. New Zealand hinds 4½d., New Zealand fores 3¾d., per lb.

Butter.—The market is somewhat steadier. Choicest New Zealand butter to-day is 110s., Australian 106s., Argentina 105s., Danish 113s., Siberian 106s., per cwt.

Cheese.—The market is quiet, but rather steadier. New Zealand white 69s., coloured 70s., per cwt.

Hemp.—The market is firmer. There is more demand. Spot—New Zealand good-fair grade £21 15s., fair grade £20 10s., per ton. Forward shipment at same price. Fair current Manila, spot, £22 per ton. Forward shipment £22 10s. per ton. The output from Manila for the week was 26,000 bales.

Wheat.—The market is active, notwithstanding advices of heavy shipments. Nominal values: New Zealand long-berried wheat, ex granary, 38s., short-berried 37s., per quarter of 496 lb.

Oats.—The market is weaker, and tendency downward in anticipation of heavy arrivals.

Peas.—The market is firmer. Nominally, New Zealand peas, partridge, 37s., per 504 lb.

Beans.—The market is steady, with a moderate inquiry. Nominally, New Zealand beans, f.a.q., old crop 39s., per 504 lb.

Hops.—The market remains firm.

Mutton and Lamb.—River Plate shipments received during the month of April, 1912, are as follows :—

	Mutton. Carcases.	Lamb. Carcases.
London	69,527	10,533
Liverpool	101,344	54,400
Hull	5,500	..
Newcastle	14,919	1,636
Southampton	14,960	1,350
Cardiff	8,316	..
Plymouth	1,056	523
Ireland	1,878	..
	217,500	68,442
April, 1911	229,845	86,702

POULTRY AND PIG PRODUCTS.

London, 23rd April, 1912.

Eggs.—The market is firm, owing to reduced supplies. Per 120 : Home, 8s. 9d. to 9s. 6d. ; Italian, 8s. 9d. to 9s. 6d. ; Austrian, 8s. 3d. to 8s. 9d. ; French, 9s. 3d. to 10s. 6d. ; Moroccan, 7s. to 7s. 6d. ; Danish, 8s. to 10s. ; Russian, 8s. to 8s. 6d.

Poultry.—The market is steady, and a fair business doing. Chickens : Home, 9½d. to 1s., per lb. ; Russian, 8d. to 9½d. ; Americans, 8½d. to 10d. Ducklings : Home, 10½d. to 1s. 2d., per lb. ; Chinese, 5½d. to 7d. ; Russian, 5½d. to 7d. Turkeys : French, 10d. to 11½d., per lb. ; Italian, 8½d. ; Russian, 9d.

Bacon.—The market is firm, at the advance. A moderate demand, but the weather is fine for favourable consumption. Sides : Irish, 64s. to 72s., per cwt. ; Danish, 60s. 71s. ; Russian, 56s. to 63s. ; Canadian, 61s. to 68s.

Hams.—The market quiet but firm for English and Irish, and for American and Canadian the market is firm with an improved demand. English, 88s. to 100s., per cwt. ; Irish, 84s. to 96s. ; American, 59s. to 67s. ; Canadian, 64s. to 72s.

LINSEED.

London, 4th April, 1912.

The market is quiet, with a tendency in favour of buyers, in anticipation of larger supplies than last year. Present selling-prices are : *Ex* granary, per 416 lb. : Bombay, 70s. 6d. ; Calcutta, 70s. ; Plate, 65s. 6d.

THE WOOL MARKET.

London, 4th May, 1912.

The wool sales have closed. The market is strong, a very large demand, especially for superior merino and strong crossbreds. Prospects are favourable : 7,700 bales of New Zealand wools are held over. Estimated values : Superior merino 1s. to 1s. 1½d., medium 9½d. to 11½d., inferior 7½d. to 9d., fine crossbreds, all grades, 11d. to 1s. 1½d., medium crossbreds 8½d. to 11d., coarse crossbreds 7½d. to 10½d., per lb.

The s.s. "Otaki," which sailed from Wellington for London on the 29th March, loaded at Waitara 1,116 quarters of beef for the Imperial garrison at Gibraltar.

The distribution of all wools sold in Australasia for the season 1911–12 is estimated to be—Home trade 379,389 bales, percentage of total sales 22¾ per cent. ; Continent 1,177,245, 68½ per cent. ; local manufacturers and scourers 78,434, 4½ per cent. ; United States 48,306, 2½ per cent. ; Japan and India 33,851, 1¾ per cent.



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15TH JUNE, 1912.

PRICE,
SIXPENCE.

IMPURE SEED.

THE SOURCE OF OUR WEED PROBLEM.

A. H. COCKAYNE.

INTRODUCTION.

ONE of the most serious problems confronting the farmer of this Dominion is the adequate control of noxious weeds. The following is presented in the belief that comparative immunity from many of our worst weeds can be secured by the avoidance of actually sowing them, often quite unwittingly, along with ordinary farm seeds. It also appears highly desirable to point out the many advantages attendant on the employment of seeds of only the highest grade. By this means it is hoped to stimulate a more lively appreciation of this type of seed as compared with low-grade inferior lines: these are sown, unfortunately only too often, under the totally erroneous conception that being cheaper

in price they must therefore be the more profitable. One of the main objects of this article is to disprove this fallacious idea. It is essential to bring home to the farmer the indisputable fact that the sowing of low-grade weed-infested seed is not only of immediate and incalculable harm to the user himself, but also forms a very grave menace to the future prosperity of the whole Dominion.

NOXIOUS WEEDS.

The term "noxious weeds" is generally restricted to those undesirable plants of our flora that the farmer by actual legislation is compelled to suppress, or at least hold under control in some small measure. Many settlers perform only the minimum of work necessary to satisfy the Inspector. Unfortunately they look upon the work incurred merely as a means of avoiding conflict with the law, and not as a means of freeing the land from a serious incubus that is exhausting the resources of the soil. With regard to "noxious weeds," a much broader view of the term should be taken; in fact it should include all those plants whose growth interferes with the yield of the crop or pasture on the soil where they are growing. At a moderate estimate weeds diminish the annual producing-power of our land by at least 5 per cent. This represents a yearly loss of nearly £1,000,000 sterling on our agricultural exports alone. A good deal of this loss is now almost irremediable in those soils which year after year have carried large numbers of weeds, filling the ground with innumerable seeds that will develop whenever a favourable opportunity arises. Much of the loss can, however, be avoided.

THE ORIGIN OF OUR WEED FLORA.

The vast majority of our weeds owe their origin to having been actually sown, in most cases quite unintentionally, along with ordinary agricultural seeds. With certain exceptions, such as blackberry, sweet-briar, gorse, and broom, all our weeds which injure crops and pastures can be attributed to this cause. Impure seed can thus be reckoned upon as the greatest factor in the production of our noxious-weeds problem.

THE AREA LAID DOWN IN GRASS.

Annually large areas of virgin country, in many cases quite free from weeds, are sown with grass and clover seeds. During the past ten years about two million acres have been dealt with in this way. If on this area only pure seed had been used the weed problem would on it be quite a negligible quantity. The significance of this is apparent.

On a very large proportion of the pasture yearly laid down the first sowing is the only one that can ever be successfully carried out. When this is

considered it can be clearly understood that the future results from such ground depend to a very large extent on the quality of the seed used.

THE NECESSITY FOR TESTING.

From the above it can be seen how important it is to ascertain the quality of all seed that is to be used for sowing. Before purchasing, the farmer should accurately determine what impurities are present in the samples, and those showing any that are likely to cause harm should be rejected.

The necessity for testing seeds before sowing is well recognized in older countries. In most European countries the farmer buys his seed on a written guarantee as to its purity and germination, and if he sows seed containing noxious weeds he has only himself to blame.

THE DESIRE FOR BARGAINS.

The desire for "bargains" in seed-buying is one that the farmer should sternly repress. It can safely be taken as an axiom that there are no "bargains" in the seed trade. The average seed-merchant knows to a nicety the market price of seed of average quality, and he is hardly likely to sell good seed at a price below the ordinary market rate.

Some examples of so-called cheap seed may not be out of place here. These are taken from actual samples examined during the past year:—

White Clover.—The price for a certain line of white clover was 1s. 1d. per pound. Good white clover could be purchased at the time at 1s. 6d. The sample gave a purity of 64 per cent. and a germination of 33 per cent., or a real value of 21 per cent.—*i.e.*, in 100 lb. of the sample only 21 lb. consisted of pure white clover capable of growing. Thus over 5s. was the price actually paid for 1 lb. of pure white-clover seed. The 34 per cent. of impurities consisted of twenty-three different kinds of weed-seeds present to the number of 230,000 individual seeds to each pound.

Another sample of white clover that was offered below the current market price contained thirty-six different kinds of weed-seeds.

Red Clover.—A line of red clover offered at a very cheap price contained 10 per cent. of impurities, consisting of sixteen different weed-seeds. Amongst these was clover dodder at the rate of over 8,000 seeds per pound. Another sample contained over 20 per cent. of impurities, consisting of twenty-three kinds of plants other than red clover.

Timothy.—The following is an analysis of a line of New Zealand timothy that was offered for sale: The purity was 94.3 per cent., and 1 lb. of the seed contained the following seeds other than timothy: Ragwort, 41,374 seeds; Yorkshire fog, 9,513 seeds; mouse-eared chickweed, 9,060 seeds;

Poa pratensis, 2,416 seeds; docks, 453 seeds; sow-thistle, 453 seeds; Californian thistle, 151 seeds: total, 65,420 seeds.

The above examples serve to demonstrate the contention that cheap seed means bad seed, and the use of bad seed is the most expensive policy that any farmer can adopt.

A KNOWLEDGE OF SEED IMPURITIES IMPORTANT.

There are few farmers who have sufficiently studied the question of weed-seed impurities to enable them to tell at a glance the most common weeds likely to be found in agricultural seeds. In order that our farmers and seed-merchants may be provided with a ready means of determining the most common impurities found in agricultural seeds the Department has prepared a neat reference-card, mounted between sheets of glass, containing the seeds of fifty of the most common weeds to be found in ordinary commercial samples. Attached to it is a pocket magnifying-glass. This complete little demonstration guide will be offered at a price which will just cover the cost of preparation.

LIST OF THE SEEDS IN THE WEED-SEED REFERENCE-CARD.

Twitch (<i>Agropyron repens</i>).	Chicory (<i>Cichorium intybus</i>).
Goose-grass (<i>Bromus hordeaceus</i>).	Hawkweed (<i>Crepis capillaris</i>).
Hair-grass (<i>Festuca bromoides</i>).	Ox-eye daisy (<i>Chrysanthemum leucanthemum</i>).
Yorkshire fog (<i>Holcus lanatus</i>).	Catsear (<i>Hypochaeris radicata</i>).
Darnel (<i>Lolium temulentum</i>).	Nipplewort (<i>Lapsana communis</i>).
Buttercup (<i>Ranunculus parviflorus</i>).	Hawkbit (<i>Leontodon hispidus</i>).
American cress (<i>Barbarea praecox</i>).	Mayweed (<i>Matricaria inodora</i>).
Wild turnip (<i>Brassica campestris</i>).	Ox-tongue (<i>Picris echioides</i>).
Shepherd's purse (<i>Capsella bursa pastoris</i>).	Ragwort (<i>Senecio Jacobaea</i>).
Cress (<i>Lepidium ruderales</i>).	Sow-thistle (<i>Sonchus oleraceus</i>).
Hedge mustard (<i>Sisymbrium officinale</i>).	Dandelion (<i>Taraxacum officinale</i>).
Catch-fly (<i>Silene gallica</i>).	Scarlet pimpernel (<i>Angallis arvensis</i>).
Spurrey (<i>Spergula arvensis</i>).	Vipers bugloss (<i>Echium vulgare</i>).
Tutsan (<i>Hypericum androsaemum</i>).	Dodder (<i>Cuscuta trifolii</i>).
Cranesbill (<i>Geranium dissectum</i>).	Mullein (<i>Verbascum blattaria</i>).
Suckling clover (<i>Trifolium minus</i>).	Vervain (<i>Verbena officinalis</i>).
Vetch (<i>Vicia sativa</i>).	Self-heal (<i>Prunella vulgaris</i>).
Hemlock (<i>Conium maculatum</i>).	Ribgrass (<i>Plantago lanceolata</i>).
Wild carrot (<i>Daucus carota</i>).	Plantain (<i>Plantago major</i>).
Cleavers (<i>Galium aparine</i>).	Pigweed (<i>Amaranthus retroflexus</i>).
Yarrow (<i>Achillea millefolium</i>).	Fathen (<i>Chenopodium album</i>).
Chamomile (<i>Anthemis cotula</i>).	Wireweed (<i>Polygonum aviculare</i>).
Spear thistle (<i>Carduus lanceolatus</i>).	Smartweed (<i>Polygonum persicaria</i>).
Californian thistle (<i>Cnicus arvensis</i>).	Narrow-leaved dock (<i>Rumex crispus</i>).
Star thistle (<i>Centaurea cyanus</i>).	Sorrel (<i>Rumex acetosella</i>).

HOME TESTING.

While it is very necessary that the purity of a seed-sample under offer should be determined, it is of equal importance that its germination-capacity should be known. This is required not only for the purpose of estimating its true value, but also to show what quantity would be required adequately to clothe a given area, for it is obvious that a high-germinating seed will go much further than a low-germinating one.

The necessary conditions for the germination of almost all the commoner grass and forage-crop seeds (*Poa pratensis* being an exception) may, with the aid of very simple apparatus, be obtained at home. Water, air, and heat are the main requisites. Water is supplied by means of a piece of blotting-paper (or thin flannel) placed in a saucer or similar receptacle. The seeds are counted on to this material, which is thoroughly saturated every day with water. No more water should be applied than can be taken up by the blotting-paper, but it is just as necessary that the paper should not be allowed to become dry. In order to prevent too rapid evaporation of the moisture, the top of the saucer should be almost covered with a strip of glass, wood, or cardboard, a small opening being left to admit of the entrance of air. 60° to 80° Fahrenheit suffices to sprout the seed; this is a common temperature in a warm room or a kitchen.

The actual seed chosen for germinating should, as nearly as possible, be representative of the bulk. Thoroughly mix the entire sample, and, taking a pinch from it, indiscriminately count out exactly a hundred pure seeds. Place them on the wet blotting-paper, partly cover the saucer, and place it in a uniformly warm place. In counting out the seeds it is important that they should be taken *just as they come*, and that the common tendency to select the plumper and more promising-looking seeds should be overcome. The counting should be accurately done, so as to facilitate estimating the germination percentage at the conclusion of the test.

In seven days' time all sprouted seeds should be counted out of the saucer and a record kept of the number. This should be repeated at intervals of seven days until all the living seeds have sprouted. The following table shows the times in which a very good idea can be formed of the germination percentage of various seeds.

Cowgrass	} 14 days.
Red clover	..	..	..	..
White clover	..	..	..	..
Alsyke ..	..	..	..	..
Lucerne	..	..	..	..
Trefoil ..	..	..	..	..
<i>Lotus major</i>	

<i>Lotus corniculatus</i>	} 14 days.
Rye-grasses	..	..	..	..
Timothy	..	..	..	..
Mustard	..	..	..	..
Turnips, rape, &c.	..	..	..	..
Cereals	..	..	..	..
Peas	} 21 to 28 days.
Cocksfoot	..	..	..	..
Fescues	..	..	..	..
Crested dogtail	..	..	..	..
Meadow foxtail	..	..	..	..
Fiorin	..	..	..	..

It is worthy of note that very slow-germinating seeds, if placed in the field, would require such a long period of favourable weather that their chances of surviving would be much reduced. It would probably therefore be advisable not to include in the germination-percentage any individual seeds that took longer than twenty-eight days to germinate.

At the end of the test the number of seeds recorded as having sprouted out of the 100 placed in the saucer represents the germination-percentage of the line of seed under test.

HOW THE DEPARTMENT HELPS.

The Biology section of the Department undertakes the examination of any seed-samples that a farmer sends to the Laboratory. All such samples, and the letters about them, should be addressed to the Biologist, Department of Agriculture, Commerce, and Tourists, Customs Building, Wellington. The accurate analysis of the samples, and a full list of all the impurities, will be supplied, together with the germination-capacity of the seed. This is done free of any charge. So far as the purity is concerned, a report can be sent within a few days of the arrival of the samples; but the germination report cannot be forwarded until the necessary time has elapsed to complete it, which varies from a week or so in the case of certain seeds, such as many of the clovers, to several weeks in the case of certain grasses. If the farmer is in doubt about the impurities that are in the seed he has bought, or wishes to buy, he should send them to the Department, and they will be identified, and the names and qualities of the plants to which they belong will be given.

POINTS WORTH CONSIDERATION.

- 1. The loss due to weeds exceeds one million pounds sterling annually.
- 2. The greatest factor in the spread of weeds is the use of impure seed.

3. Always ascertain what weed-seeds are present in a sample before purchasing.

4. Reject any samples that contain an excess of weed-seeds.

5. Cheap seed is *always* bad, but high-priced seed is not necessarily always good.

6. Never sow weed-infested seed on the score of cheapness.

7. The sowing of cheap weed-infested seed is the most expensive policy that a farmer can adopt.

8. Always ascertain the germination of grass and clover seeds before buying.

9. The weed-seed reference-card provides a ready means of identifying the more common impurities of agricultural seeds.

10. The Department of Agriculture, Commerce, and Tourists tests any seed received from farmers free of charge. Why not avail yourself of this opportunity?



A SECTION OF THE FRUIT-TESTING ACRE ESTABLISHED BY THE STOKE FRUIT-GROWERS' ASSOCIATION ON THE PROPERTY OF MR. E. B. IZARD, STOKE.

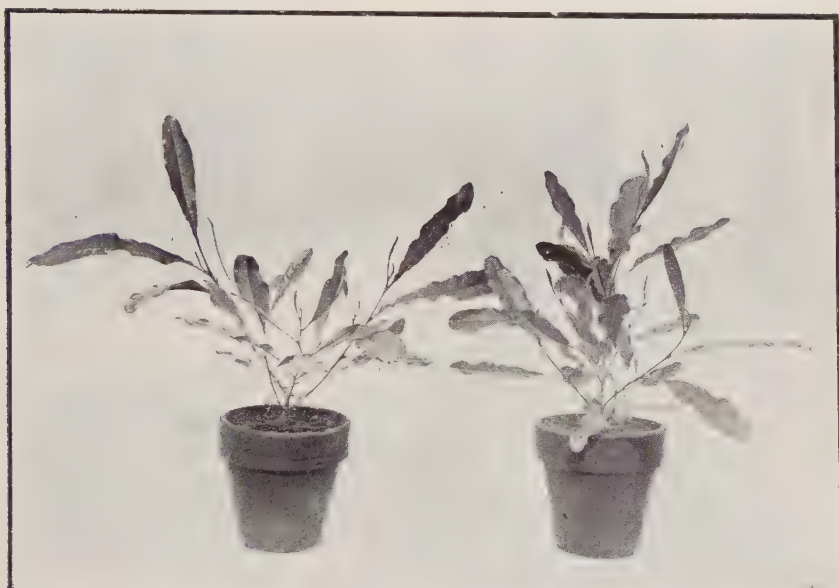
NATIVE TREES AS HEDGE-PLANTS.

A. W. GREEN.

A NATURAL corollary to the great range in latitude of New Zealand, a range which for its size is unparalleled, is that the extent of the variation of its flora is quite unique. A feature of this indigenous plant-life is that an exceptionally high proportion is of a shrubby nature, and therefore lends itself admirably to the formation of hedges.

*PITOSPORUM HUTTONIANUM.*

Unfortunately, up to the present this fact has not been realized. There is every probability, however, that some now almost unknown native plants will in time become favourites for this purpose. For some years past it has been the desire of the Director of Experimental Farms to bring into prominence as many species as possible which



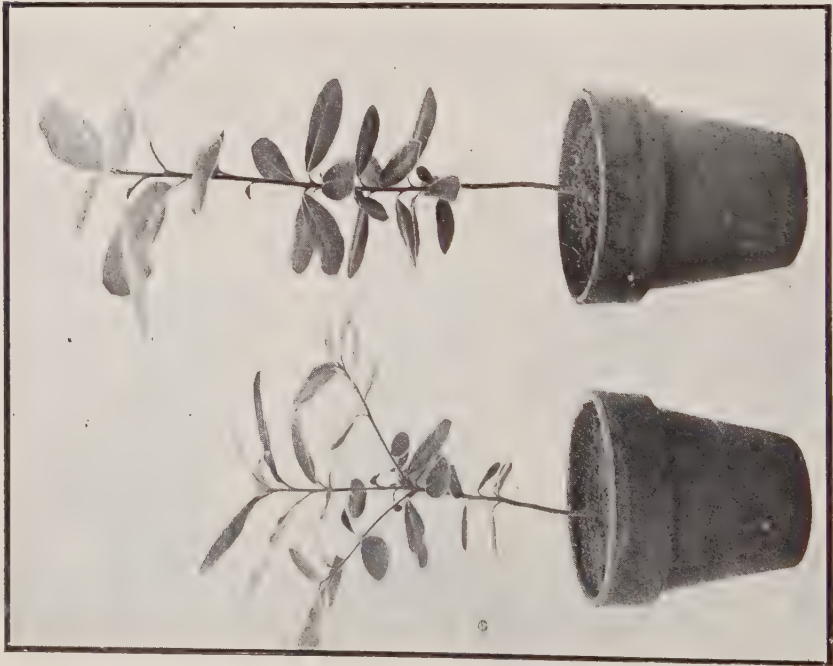
DODONEA VISCOSA.



PITTOSPORUM EUGENIOIDES.



COPROSMA BAUERI.



PITTOSPORUM RALPHII.

are likely to prove suitable, and, while collecting, raising, and cultivating the various specimens, the following information has been gathered.

The first and most important factor necessary to ensure success, it has been found, lies in the treatment of the trees in their young stage. The aim must be to eliminate the trunk, thereby forcing growth into laterals, so that a dwarf bushy habit is assumed. This will produce a compact dense hedge. The accompanying photographs



SENECIO GREYII.

(except that of the akeake) may serve to illustrate the method of pinching back the seedlings, and the results obtained. Those shown on the left of the pictures are specimens rightly grown, while those on the right illustrate what must be avoided. Tall, slim, plants will never make a close hedge. Their first branches arise too far from the ground, thus the hedge becomes open at the bottom. The height of the seedlings when pinched may vary according to the variety, but, as a rule, top 3 in. or 4 in. from the ground. When

propagating the plants by cuttings, topping is not usually necessary, for, generally, two or more of the uppermost buds give rise to branches. Unfortunately, a great number of the native trees do not strike readily from cuttings.

Species of the order Pittosporaceae are proving suitable for hedges. *Pittosporum Buchanani*, *P. crassifolium*, *P. eugenoides*, *P. Huttonianum*, *P. Ralphi*, and *P. tenuifolium* are all good. They stand constant clipping, and the varied climatic and soil conditions under which the several varieties will grow allow a margin for choice. *P. crassifolium* may be considered the hardiest for windy situations or for growing near the sea-coast. *P. eugenoides* is the most delicate, and is liable to be attacked by red-spot fungus in the leaf. Even on the young seedlings shown in the photograph the fungus had appeared.

From the order Sapindaceae, *Dodonea viscosa* (akeake) and *Alectryon excelsum* (titoki) are chosen. The former can be raised from seed, and is one of the most quickly growing of the native trees. The plants shown in the photo are just seven months old from seed.

Rubiaceae is represented by *Coprosma Baueri* (taupata). It thrives in windy situations, stands much clipping, and is easily propagated either by seed or cuttings. The illustration shows the advantage of topping this variety.

The order Compositae gives several suitable trees, including *Olearia Forsteri* and *O. Traversii*. Both can be grown as neat hedges to a height of 8 ft. *Senecio Greyii* and *S. compactus* form handsome dwarf hedges. The various shades of colour in foliage and their profusion of bloom make them attractive.

The photographs of *Senecio Greyii* show two specimens eight months old from cuttings and one specimen a year older. Practically all the Compositae will grow from cuttings.

In conclusion, a word might be said in favour of some of the veronicas used as dwarf hedges. They are free-flowering, and bloom for several months of the year. They must be clipped hard back immediately after flowering, so that a young strong growth will start away the following spring. This will give new wood that will produce flowers, and tends to keep the hedge thick at the bottom.

Those who wish to plant hedges for shelter, or more particularly for ornamental purposes, will do well to first compare native with exotic trees. For beauty much can be said in favour of the native species, and to those who value our flora it is a pleasure to know that every native tree planted is doing a little towards replenishing what is gradually becoming extinguished—the New Zealand bush.

RUAKURA FARM OF INSTRUCTION.

THE FORAGE CROP OF 1911-12.

PRIMROSE MCCONNELL.

THE most desirable qualities of a fodder-plant are (*a*) Suitability to climate; (*b*) high disease-resisting powers; (*c*) the ability to return as well as to exhaust fertility.

As farming becomes more intensive the forage crop becomes of greater importance, particularly in such a country as New Zealand, where the trend of farming seems to be largely in the direction of comparatively small dairy farms. A large herd on a small area should be the aim of all dairy-farmers, and this can only be brought about by the most intensive system of cultivation that is possible under the circumstances. In growing forage crops the aim should be to have a succession of such crops all the year round. Among forage crops I include hay and roots, and, of course, ensilage made from green fodder. In exceptionally dry seasons the difficulty of obtaining a succession of crops is admitted, but it is in such seasons that ensilage is of importance, and it is well to have a supply of it in reserve to fill the gaps caused by drought.

No known forage-plant will quite come up to the standard I have quoted above, but I feel quite sure that in lucerne we have a plant that will fulfil the above requirements better than any we yet know of. Lucerne only requires to be better known in order to be appreciated at its full value; and I feel confident that there are few dairy farms in New Zealand which have not some corner where this crop can be grown successfully. Lucerne-growing has been the salvation of the agricultural industry in South America, in many of the North American States, and in other parts of the world; and I believe it will ultimately be a veritable gold-mine to the New Zealand farmer.

Apart from lucerne, I would advise the North Island farmer not to forsake such an old friend as maize, or, better still, maize and peas. Recent experiments seem to prove that the growing of maize and peas together is beneficial in three ways. The legume and the non-legume when grown together not only provide a better-balanced food, but they leave the land in better condition than when maize is grown by itself, and it is claimed that the maize is then of higher

feeding-value than when grown alone. It must be recognized that in these days of blights and parasites a plant such as maize, which is almost blight-proof, is of enormous value on that account, even if it exact a heavy toll on the fertility of the soil. The latter evil must be remedied by heavier manuring and more careful cultivation, the result of which will more than pay for the extra outlay. Such a season as the present is not so suitable for growing maize to perfection; but in the variety-maize crop at this station there is ample proof that heavy manuring and thorough cultivation, provided the land is reasonably dry, enables maize to thrive, even in such seasons.

In the rape and kale crops, the first crop on poor newly drained swamp, there is also ample proof that a suitable environment, in the shape of well-drained soil, thorough cultivation, and manuring, enables the plants to resist blights which they cannot resist under adverse circumstances. I do not infer that such environment will absolutely banish blights, but it will do much in the way of prevention, for the healthier the plant the greater is its disease-resisting power. Plants grown on rich virgin soils are not so subject to disease as those grown on soils which have been cultivated for some years and have had their fertility reduced. In the rape, Bhuda kale, and Thousand-headed kale field there are several exceptionally poor patches, and it was only there where blight or aphids were present to any extent.

Soya beans and cow-peas have been a comparative failure; and, although it is yet too soon to form a definite opinion, I do not think that in an average season the New Zealand climate will be found suitable for the growing of these crops profitably. The failure is due more to unsuitable climatic conditions, intensified by an abnormal season, rather than to unsuitable soil-environment. Of course, it is just possible that further north, where the weather is warmer and the locality possibly more suitable, greater success may be achieved; speaking generally, however, I consider that the place of these two crops may be well filled by other legumes, such as tares and peas, which are hardier, and their success is more certain. In the case of the Soya bean, where the seed can be properly ripened the crop is of greater commercial value; but the climate of New Zealand, generally speaking, is, I think, too uncertain to warrant the cultivation of this plant on a large scale, although a variety may yet be found that will suit the climate. It is interesting to note that in a row of Soya beans growing in the nursery from seed grown last season on the farm, although the plants are strong and healthy, not a single bean-pod has been produced.

Chou moellier has been an unqualified success. Two acres were grown in No. 29 paddock, the seed being sown on ridges 27 in. apart, and the plants singled out 18 in. to 2 ft. apart in the rows. No. 29

is newly drained land, in poor condition, and the success of the chou moellier on such soil is extremely encouraging. This crop has been entirely fed to milk-cows, and, in contrast to rape, Bhuda and other kales, it has been found to produce a good quality of milk and butter entirely free from taint. The feeding of this crop was commenced at a comparatively early stage, the plants being cut close to the ground. The cows ate the stalks as well as leaves greedily, and this I consider a better and less costly system of feeding than when the leaves are broken off and the stalks left to produce another crop of foliage—in which case the stalks become so woody that cattle will not eat them. It must also be remembered that, as in the case of rape, the greater nutriment is in the stalk; and the longer length of time the latter is grown the greater will be the tax on the soil. The bulk of the weight of the crop is also in the stalk, so that it is imperative to use this portion of the plant when it is in a state sufficiently tender to be palatable, instead of allowing the greater part of it to go to waste in the end. By sowing the chou moellier seed in September (or even August, weather permitting) the plants should come to maturity at the beginning of January. The plan of growing the plants in a seed-bed and transplanting out is very costly. The seed should be sown as for a turnip crop, and afterwards singled out with the hoe. Such a favourable report on this crop must not, however, be taken as final, as, being a surface feeder, it may not resist periods of drought, and as a disease-resister it has not been put to a severe test.

An attempt was made to test the milk-producing qualities of different fodder-plants; but, grass being so abundant, additional food of any kind had little or no effect on the milk-yield, which is further proof of what I ventured to point out in a previous article—namely, that if a cow has abundance of good grass, supplementary feed is to a great extent a luxury. It will, of course, save the grass in the meantime, and leave a fuller bite for the winter months. Such abnormal seasons, when grass is exceptionally abundant, unfortunately do something to discourage the growth of forage crops, as a season of plenty is apt to make us forget the seasons of scarcity. Nothing need be wasted, however, as spare fodder can be turned into ensilage, a stack of which will be of great value in periods of drought.

Three varieties of sorghum were sown and resown, but in each instance the young plants were destroyed by larks.

Several varieties of maize, sown early in the season (11th October) on poor soil, perished through excessive cold and wet.

The Bhuda kale, rape, cow-kale, and Thousand-headed kale were sown separately in No. 41 paddock, and as an experiment were fed off with bullocks, twelve of which were weighed before turning them

on the crop. Other twelve were weighed, all from the same mob, and turned into grass aftermath. Each lot was again weighed at the end of four weeks, when it was found that those on the grass aftermath had made a total gain of 4 cwt. 2 qr. 16 lb., while those on the kale and rape had lost 4 cwt.; so it is very evident that such a crop is not as suitable for fattening bullocks as for sheep. It was found, however, that the bullocks' dislike to the Thousand-headed kale was similar to that shown by the sheep. The rape was first eaten, followed by the Bhuda kale and cow-kale, the Thousand-headed kale being left severely alone until the very last. No doubt the bullocks would have done much better had they had the choice of one variety only. It was also evident that the loss in weight occurred in the early stage of the experiment.

The land on which the fodder crops were grown was twice ploughed, and afterwards thoroughly cultivated to a fine tilth. All the seeds, including maize, were sown by the double ridger, the ridges being 27 in. apart. During the summer all crops were repeatedly horse-hoed. The manure which gave the best result was a mixture of equal quantities of basic superphosphate and Malden Island guano. Seychelles guano is also giving a good all-round result on all crops. In comparing the dates of maturity, given in the following table, it must be remembered that this season all forage-plants were at least a fortnight later than in the average season.

The Red Kentucky Moonshine maize is an excellent main-crop variety, with foliage right to the bottom of the stalk, and, as the table shows, an enormous cropper. The seed of the Angel of Midnight maize was procured from the College of Agriculture, Ontario. This variety stools out better than any other, but does not give the weight per acre. James's Eclipse is an excellent late variety. The Californian millet is a new variety that promises well, and, although sown rather late on poor soil, the result was comparatively good. In feeding the maize and millet it was found that if cattle had their choice they ate the maize and refused the millet. The latter has three good qualities that are wanting in maize—it is not easily broken down by the wind, and if cut early will give a good second growth; also, in making ensilage of it there will be less waste, the stalks being finer. At the same time, it is doubtful if it will ever become as popular as maize.

About a quarter of an acre of helianthi has been grown, with the object of testing its value as a pig-food. The tops reached a height of 9 ft. In the beginning of April seven weaner pigs were turned into the plot, but it was soon noticed that they had not much relish for their new food. I made a careful examination of the roots and found that, without exception, they were more or less diseased, many of them being completely rotten, and had exactly

the appearance of a rotten potato. Specimens have been forwarded to the Biologist for examination. I do not consider this plant as good as the ordinary artichoke, the tubers being much smaller. I also find that the tops are not relished by stock, although they would no doubt be eaten in a season of scarcity, and they could also be made into ensilage. In any case this sudden attack of disease is not encouraging.

This report does not include the main rape crop, on which several manurial tests were made. A full report on this will be issued later, also a report on all root crops.

Variety.	Date sown.	Seed per Acre.	Date of Maturity.	Tons per Acre of Green Fodder.	Height in Feet.
Millet—					
Japanese	Nov. 20 ..	10 lb.	Mar. 15 ..	22-61	5½
Hungarian	Nov. 25 ..	"	" ..	18-00	4½
Maize—					
Angel of Midnight ..	" ..	2 bush.	Mar. 1 ..	23-22	6½
Pride of the North ..	" ..	"	Mar. 30 ..	24-37	8
Iowa Silvermine ..	" ..	"	" ..	31-90	8½
Hickory King ..	" ..	"	Mar. 15 ..	26-69	8
Black Mexican ..	" ..	"	" ..	14-50	5½
Virginian Horsetooth ..	" ..	"	" ..	31-90	8
Eclipse	" ..	"	April 1 ..	24-95	10½
Kendal's Early Sweet Corn	" ..	"	Mar. 1 ..	22-05	6½
Red Kentucky Moon-shine	" ..	"	Mar. 15 ..	46-42	11
Millet—Californian ..	Dec. 6 ..	10 lb.	April 1 ..	15-00	4
Chou moellier	Nov. 2 ..	2 lb.	Mar. 1 ..	40-91	4-5
Soya beans	" ..	1 bush.	April 1 ..	"	2
Cow-peas	Dec. 15 ..	"	A comparative failure.		
Bhuda kale	Dec. 23 ..	2½ lb.	Mar. 1 ..	23-92	2½
Cow-kale	Nov. 6 ..	"	" ..	19-15	3
Rape	Dec. 23 ..	"	" ..	27-85	3
Thousand-headed kale	Nov. 7 ..	"	" ..	29-88	3-4

THE object of the Department is to promote the agricultural industry of the Dominion, and to assist primary producers in their endeavours to this end it heartily welcomes the co-operation of the farmer in its campaign for improved methods. In the necessary precautions against disease of plant and animal life the law has sometimes, unfortunately, to be appealed to, in order to enforce compliance with legislation framed in the interests of the individual himself and for the protection of his neighbours. The duty is not a pleasant one for the Department, which is an educative and not a coercive service, but it must be carried out in the interests of agriculture and the country.

BASIC SLAG.

THE PHILOSOPHER'S STONE OF THE PASTORALIST.

B. C. ASTON, F.I.C.

PART I.

THE philosopher's stone for which the alchemists vainly sought was, they hoped, a substance by which base metals might be transmuted into gold. Basic slag, of all substances, most nearly realizes the pastoralist's dream of a magic something, the touch of which should clothe the languishing earth with a perennial verdure.

In the following pages endeavour will be made to bring home to the reader some of the leading facts of a substance concerning the effects of which sober men of science, agriculturists, and other practical men guiltless of flights of fancy have used such terms as "wonderful" and "marvellous."

New Zealand is almost wholly a pastoral country. More than three-fourths of the total exports may be reckoned as directly derived from pasture. There is no known substance which has been so successful in ameliorating poor pastures in temperate moist climates as basic slag. The subject is therefore one of extreme importance to the farmer and to the Dominion. This article deals with the origin and nature of basic slag, reserving for a future number of the *Journal* the results of the application of slag to the soil.

ORIGIN.

Basic slag, also known as "basic cinder," "Thomas slag," "Thomas phosphate," or "Thomas meal," and in America as "odourless phosphate," is the finely ground furnace-slag obtained as a by-product in the Thomas-Gilchrist basic process of making mild steel. The process, which was introduced in 1879, entails heating the molten pig iron to a very high temperature in a pear-shaped vessel known as a Bessemer converter. The walls of this vessel are lined with lime or dolomite (magnesian limestone), or a mixture of dolomite, lime, and tar. An air-blast is blown through the molten mass, whereby the impurities of the iron, consisting of the elements phosphorus, manganese, silicon, carbon, and sometimes sulphur and vanadium, are oxidized or burnt. These oxides are either basic or acidic, and are capable of combining with each other (excepting the carbon-oxides.

which are volatilized), with the lime and iron-oxide which are thrown into the molten mass, or with the lime and magnesia of the furnace-lining, to form a slag which floats on the surface of the molten metal. The further details of the process do not concern the agriculturist, and need not be here narrated. The slag is removed by suitable means from the surface of the molten metal, allowed to cool, and finally pulverized. The ground slag is now a marketable article, and without further treatment is in the most suitable condition for applying to the soil.

DISCOVERY OF FERTILIZING-VALUE.

The basic process of making mild steel was an accomplished fact in 1879; but no use was found for the thousands of tons of waste slag until three or four years later, in 1883, when it began to attract attention as a fertilizer. Comprehensive experiments, both in field and laboratory, were then undertaken, notably by Professor Wagner, of Darmstadt, in Germany, and by Wrightson and Munro in England, with the result that the use of finely ground basic cinder was fully justified, on soils rich in organic matter,* for all crops; on all soils, if not too dry in character, and on clay soils poor in lime.

GROWTH AS A FERTILIZER.

Since 1886 basic slag has been on the market, and no other fertilizer has advanced so rapidly in the farmers' favour. In 1887 300,000 tons were used in Germany alone. In 1880 the production of this slag in the Grand Duchy of Luxemburg and Germany was only 4,326 tons, in 1890 it was 358,320 tons, and in 1899 it had risen to 953,570 tons. The production of basic slag in Europe in 1901 exceeded 1,700,000 tons.

As showing how the slag is distributed the following figures (for 1899) showing production and consumption may be cited:—

			Production. Tons.	Consumption. Tons.
Germany	..	..	1,009,000	895,000
France	..	..	166,000	170,000
Great Britain	..	..	267,000	128,000
Austria-Hungary	..	..	63,000	92,000
Belgium	..	..	131,000	89,000
Sweden	..	..	..	58,000
Italy	..	..	..	56,000

* As showing the intense solvent power which organic matter has on slag phosphate an experiment made by Albert may be quoted: 1 gram of basic slag and 100 grams of peat were mixed together in 1 liter of water, and it was found that after standing for fourteen days 79 per cent. of the phosphoric anhydride had become soluble.

In New Zealand basic slag has steadily increased in popularity, as the importations for the undermentioned years show :—

		Tons.	Value.
Year ending 31st March, 1909	..	4,321	£14,595
" " 1910	..	5,013	£16,126
" " 1911	..	8,670	£28,231
" " 1912	..	16,107	£52,976

Great Britain is the only country in Europe in which the production of Thomas's slag largely exceeds the consumption. Thus, in 1899, more than half the total output was exported to different countries, chief of which were Germany, which took 34,000 tons, and France, 30,000 tons.

The world's consumption of slag was, in 1906, estimated in round figures at 2,500,000 tons annually, of which Germany used 1,300,000 tons, and the United Kingdom only 170,000 tons. The average consumption per acre of grass and tillage land is, in Germany, 32 lb., in the United Kingdom about 8 lb. As a possible correlative of this



THE CONVERTER TURNED UP, WITH THE "BLOW" IN OPERATION.

fact, it has been pointed out that the yield of grass in Germany has increased nearly 20 per cent. since the application of basic slag became general in that country, where, it may be added, about one-half of the phosphoric acid used in field-manuring is applied in the form contained in basic slag. In Great Britain slag did not begin to be used to any extent until 1894.

It is interesting to note the effect which the advent of the basic process—so called from the fact of the preponderating use of the alkaline or basic materials, lime, magnesia, and iron oxide, in the manufacture—has had on the production of steel. According to Storer 85 per cent. of the known deposits of iron in Great Britain are contaminated with more than one part of phosphorus per thousand. When the ores are smelted practically the whole of the phosphorus remains in the pig iron, and it was a matter of no little difficulty to convert such pig iron into steel, as the pigs contained from 2 per cent. to 4 per cent. of phosphorus, which, if not removed, would



THE CONVERTER TURNED DOWN AFTER THE "BLOW" IS FINISHED, AND THE SLAG BEING POURED INTO THE "LADIE" BELOW.

render the resultant steel brittle or "cold short." The basic process has therefore not only enabled low-grade iron-ores to be largely utilized in the manufacture of mild steel but has proved a method of removing a harmful impurity from the iron, and converting such impurity into an extremely valuable manurial constituent. Some idea of the amount of steel produced by the process may be obtained from the figures for slag-production quoted, when it is remembered that for every ton of slag made five tons of steel are produced.

COMPOSITION.

Basic slag is essentially a mixture of phosphates and silicates of lime, magnesia, manganese, and iron, together with small quantities of other compounds of minor interest. All the main constituents vary within certain limits, with one exception—lime—which is always constant within relatively narrow limits.

The following complete analyses* show the manner in which the composition may vary:—

	K153	K376	K842	%
Loss on ignition	0.85	2.40	..	..
Silica	10.32	14.50	18.90	7.38
Iron-oxides	12.50	17.46	15.81	22.16
Phosphoric anhydride	18.85	10.52	8.55	14.36
Lime (CaO)	46.40	43.66	44.00	41.58
Alumina	2.15	2.40	2.60	2.57
Magnesia	3.90	4.60	4.33	6.14
Manganese oxide	4.20	3.65	4.80	3.79
Sulphuric anhydride .. .. .	..	..	..	0.31
Calcium				
Vanadium oxide				
Sulphur	0.80	1.23	1.01	0.23
Solubility of phosphoric anhydride in 2 per cent. citric-acid solution	15.50	8.95	4.44	..
Fineness (percentage passing through sieve of 10,000 meshes per square inch)	76.00	86.00	59.00	..

Although slag varies so much in composition, its aspect to most of the senses is unvarying. Certainly, to some extent one might become expert at roughly judging the fineness of a sample by the sense of touch; but there is no fertilizer concerning which so little may be learnt by a hand-and-eye examination as basic slag. This fact may account, to some extent, for the cautious way in which the British farmer has received an article which has no smell or taste, and which looks and feels like so much fine grit. His preconceived notions of a strong fertilizer are that it should certainly smell, taste, and look strong. "You wouldn't think it to look at it," was a farmer's comment recently on a successful application of slag to pasture.

Experiments have shown that the efficacy of basic slag is directly proportional to the quantity of the total phosphate of lime which is soluble under certain conditions in a 2-per-cent. solution of citric acid. Citric acid as a solvent for slag has, however, only in recent years (1906) been recognized by regulations under the Fertilizers and Feeding Stuffs Act of Great Britain. This solvent is not yet recognized by the New Zealand Fertilizers Act, 1904, which was framed upon the British Act two years before the regulations appeared.

The phosphoric anhydride in basic slag was supposed by some to exist wholly in the form of tetra-calcium phosphate, in which four atoms of calcium are contained in the molecule; certainly investigators have isolated crystals of the composition stated.†

* The above analyses were performed in this laboratory except the last, which is the oft-quoted one by Stead and Ribsdale (Iron and Steel Inst. Jour., 1887, p. 22).

† Hilgenstock, June, 1886, *et alii*. Stead and Ribsdale—J. C. S., 1887—state that the whole of the P_2O_5 is in the form of tetracalcic phosphate. Wiley, "Fertilizers," states that in all good slags the lime and P_2O_5 will be found combined in this form. A. D. Hall, "Fertilizers and Manures," 1910, considers it more probable that the typical phosphoric-acid compound of basic slag has the formula $(CaO)_5, P_2O_5, SiO_2$ rather than $(CaO)_4, P_2O_5$ —that is to say, it is a compound of lime with phosphoric and silicic acids.

For the sake of comparison the kind of phosphate found in other phosphatic fertilizers may be stated:—

(1.) Monocalcium phosphate (in “superphosphate of lime”) is $\text{CaH}_4(\text{PO}_4)_2$, or CaO , $2\text{H}_2\text{O}$, P_2O_5 —one atom of calcium in the molecule.

(2.) Dicalcium phosphate (in “reverted phosphate”) is $\text{Ca}_2\text{H}_2(\text{PO}_4)_2$, or 2CaO , H_2O , P_2O_5 —two atoms of calcium in the molecule.

(3.) Tricalcium phosphate (in “bone phosphate of lime”) is $\text{Ca}_3(\text{PO}_4)_2$, or 3CaO , P_2O_5 —three atoms of calcium in the molecule.

(4.) Tetracalcium phosphate (in “slag phosphate”) is $\text{Ca}_3(\text{PO}_4)_2$, CaO , or 4CaO , P_2O_5 —four atoms of calcium in the molecule.

FINENESS.

All authorities agree that a most important factor in the success of a slag is its fineness; but that it would be extremely misleading to rely on this character alone is shown in the analyses of samples in the Department's laboratory. No. K208, which has a fineness of 91 per cent., is a low-grade slag, deficient both in available (citric soluble) and total phosphoric anhydride. On the other hand, No. K513, which has a fineness of only 70 per cent., is one of the best slags on the market in other respects. Wagner's experiments indeed show that after a certain fineness has been obtained, no better results are obtained by further grinding, and that a slag which all passed through a gauze sieve (250 wires to the linear inch) was not superior to one which left 17 per cent. behind.

Carelessness in manufacture often results in the slag containing comparatively large irregularly shaped pieces of steel—a positive fault in a slag, for not only are such slags difficult to distribute, and lead to loss of much time and temper in keeping the manure-box running clear, but they may be productive of injury to the farmers' drills.

Purchasers of slag must therefore be guided entirely by the chemist's analysis, and it is only after an hour's work that even he can say whether a sample agrees with the guarantee.

HOW TO BUY SLAG.

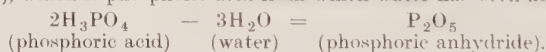
There are three points to consider in buying slag—(1) The total percentage of phosphoric acid (phosphoric anhydride); (2) the proportion of this which is soluble in a 2-per-cent. solution of citric acid when treated in a specified manner; (3) the fineness. A good article should contain from 16 per cent. to 24 per cent. total phosphoric anhydride, of which at least 80 per cent. should be soluble in 2 per cent. citric acid. From 75 per cent. to 90 per cent. of the slag should pass through a standard sieve. The sieve recommended by

Wagner and generally adopted in specifications is the one numbered 100E, made by Amandus Kahl, of Hamburg, which contains 100 wires to the linear inch.

In buying slags, or indeed any fertilizer, purchasers must not be misled by the alternative use of the terms "phosphate" and "phosphoric acid" into believing that these terms are synonymous, for tricalcic phosphate only contains less than one-half its weight of phosphoric anhydride—usually, but not quite accurately, called "phosphoric acid."* A slag containing only 8 per cent. of the anhydride may be sold with truth under a guarantee of 17 per cent. tricalcic phosphate; and the purchaser, deluded by the similarity of the figure 17 to the percentage of phosphoric anhydride usually found in a good sample of slag, buys it at a high figure, only to find that he has been misled through his want of knowledge.

One part of phosphoric anhydride (P_2O_5) is equivalent to 2.183 parts of tricalcic phosphate; conversely, 1 part of tricalcic phosphate is equal to 0.458 part of phosphoric anhydride. If a purchaser wishes to know what a certain amount of phosphoric anhydride is equal to in tricalcic phosphate, he has only to multiply the former's figure by 2.183—or, what is probably near enough for his purpose, 2.2 ($2\frac{1}{5}$). To transform tricalcic phosphate into phosphoric acid he must multiply by 0.458.

* What is meant by "phosphoric acid" in the fertilizer trade is the anhydride of the acid (P_2O_5), which is phosphoric acid from which water has been abstracted.



(To be continued.)



A CORNER OF FEDERATION WHEAT ON THE PUKEHOE PROPERTY OF MR. DONALD FRASER, BULLS.

Photo by G. de S. Baylis.

FERTILIZER EXPERIMENTS.

THE SEASON'S OAT TESTS AT RUAKURA.

PRIMROSE MCCONNELL.

THESE experiments were carried out in No. 20 paddock, 20 acres in extent, which I consider is one of the best paddocks on this farm. It was ploughed out of grass in April, rolled and disc-harrowed four times in May, and twice disced and once tine-harrowed in July. From the 14th to the 21st of July Algerian oats were sown at the rate of 3 bushels to the acre, covered in with chain harrow and Cambridge-rolled. The fertilizers on the main portion of the paddock were drilled with the oats: they consisted of $1\frac{1}{2}$ cwt. each of superphosphate and bonedust per acre. On the experiment plots (1 acre each in extent) the fertilizers were sown by hand and harrowed in. The oats were not eaten down at any stage. The fertilizers were compounded by the Chief Agricultural Chemist. No. 5 mixture arrived in a condition of paste, and could not be sown. The crop was one of the finest I have ever seen grow. Till within about a fortnight of harvest the oats stood perfectly erect, over the whole paddock, to a height of from 5 ft. to 6 ft.; then a succession of high winds with rain occurred, which twisted the crop in all directions and rendered reaping a difficult task. The accompanying table gives the results of the fertilizer experiments. The whole yield was exceptionally heavy. One-fifth of the paddock was threshed out and yielded at the rate of 80 bushels per acre, which as far as I am aware is a record here. A big yield of corn in a dull, cold season is contrary to my previous experience.

Plot.	Fertilizers per Acre.	Cost per Acre.	Yield of Dried Sheaves per Acre.	Gain by Manuring, in Tons.	Cost of Gain per Ton.
		£ s. d.	Tons.		£ s. d.
1	No manure .. .. .	.. ..	2.98	...	...
2	Superphosphate 1 cwt., bonedust 3 qr.	0 9 6	3.00	0.02	23 15 0
3	Superphosphate 1 cwt., bonedust 3 qr., sulphate of potash 2 qr.	0 17 6	4.00	1.02	0 17 2
4	Superphosphate 1 cwt., bonedust 3 qr., sulphate of potash 2 qr., dried blood $1\frac{1}{2}$ cwt.	1 9 0	3.89	0.91	1 11 10
5	Arrived in wet state .. ..	.. ..	..	..	..
6	Superphosphate 2 cwt., calcium- nitrate 1 cwt.	1 2 6	3.57	0.59	1 18 1
7	Superphosphate 1 cwt., bonedust 3 qr., sulphate of potash 2 qr., sodium-nitrate 1 cwt.	2 3 0	3.13	0.33	6 10 4

Summarizing the above it must be admitted that the nitrogenous manures, even in the shape of dried blood, have been applied with poor result, except in the case of plot 6. In the case of plot 3 the addition of sulphate of potash has given a handsome return, while a further addition of dried blood to plot 4 has reduced the result. On plot 7 a complete manure has not given as good a result as when the nitrogen is omitted.

FEDERATION WHEAT.

FEDERATION wheat was imported by the Department in 1908 from New South Wales. It is a crossbred wheat produced by the late Mr. Farrer from his Fife Indian Wheats and Purple Straw varieties. By its use in parts of Australia the average yield has been considerably increased. It is of a bronze colour, and it has lately been remarked that the typical colouring of the Australian landscape in the wheat-growing districts has been altered from gold to brown, so general has the growing of this variety become of late years. Federation resists drought, remains erect, retains its grain, and yields well. It requires to be sown rather thicker in this country than the usual varieties employed.



FEDERATION WHEAT GROWN BY MR. DONALD FRASER ON HIS PUKEHOE PROPERTY, NEAR BULLS.

The 60-acre paddock averaged nearly 65 bushels per acre.

Photo by G. de S. Baylis.

In 1908 Mr. Donald Fraser, of Pukehoe, near Bulls, co-operated with the Department in the testing of four varieties of wheat on his country. The trial plots consisted of half an acre each. Federation was the one preferred by Mr. Fraser, who has since continued to grow this variety. This season he has 70 acres in Federation, and estimates the yield at about 60 to 65 bushels per acre. Mr. Fraser's stock has been the chief source of supply in his neighbourhood, and several other areas of considerable acreage are under Federation this season.—*G. de S. Baylis.*

THE FARM DOG.

NOTES ON SOME COMMON AILMENTS AND THEIR TREATMENT.

H. A. REID, F.R.C.V.S., D.V.H.

Continued from page 369.

WOUNDS AND OTHER INJURIES.

SHEEP and cattle dogs, from the nature of their work, are very prone to sustain injuries of a more or less severe character. The feet particularly are subject to injury, varying from mere soreness, often giving rise to acute lameness, to severe wounds, sometimes accompanied by fracture of one or other of the small bones forming part of the foot. Thorns penetrating the pad are also a very common and troublesome form of minor injury. Other injuries usually consist either of contusions, the result of kicks or treads received from horses or cattle, or laceration from barbed wire or broken glass, &c. Broken limbs are also of somewhat frequent occurrence.

Whenever lameness is noticed no time should be lost in making a careful examination of the dog's lame limb. The feet first of all should be examined for the appearance of soreness of the pad or in between the claws. Gentle pressure applied to different portions of the foot will sometimes produce marked symptoms of pain at one particular spot. This should then be carefully examined for the presence of thorns or other foreign bodies embedded therein. Occasionally the substance, whatever its nature may be, will have penetrated too deeply or be too small for immediate discernment. In such cases the lameness continues, and in the course of three or four days a small pustule will appear over the seat of injury. This will at once assist in locating the exact site of the trouble and facilitate the extraction of the offending object.

When after careful inspection the foot appears to be perfectly normal the lame leg should be examined higher up. This should be done by gently bending and extending it in different directions, with the object of locating the source of the lameness. Should a broken bone be suspected, a fixed point should be made by firmly grasping the limb above the suspected fracture, and, while gently extending the leg, the other end of the bone may be moved slowly across or carefully rotated. In the case of fracture movements of this nature will produce

acute pain, accompanied, as a rule, by a grating sensation which can often be distinctly heard, and arises from contact of the ends of the broken bone. Once a fracture has been located no further attempts should be made to reproduce this "crepitus," as the contact is technically termed, nor should others be allowed to indulge their curiosity in this respect at the expense of the suffering animal, unless, of course, the dog is being professionally attended by a qualified veterinary surgeon, who can be relied upon to use proper judgment in the matter, and who will not inflict more pain in the process of diagnosis and subsequent treatment than is unavoidable in such cases. If the examination be unduly delayed, swelling of the limb will take place. This obscures the seat of fracture and renders the diagnosis more difficult.

Acute lameness sometimes results from a severe sprain, or may be occasionally a symptom of rheumatic disease. When careful examination of the limb from the foot upwards fails to discover any apparent injury, we are then generally justified in assuming that one or the other of these conditions may be responsible.

Treatment.—As a rule, wounds, such as lacerations due to barbed wire or bites, heal exceedingly well in dogs kept under natural conditions. The chief point is to keep them clean and endeavour to avoid infection of the wound by pus-producing micro-organisms. Deep punctured wounds, such as may be produced by a piece of sharply pointed iron, sometimes give trouble, owing to the difficulty of maintaining efficient drainage to allow of the escape of any matter which may form in the wound. Stitching and bandaging are best avoided unless found to be absolutely necessary, owing to the size of the wound or the amount of loose flesh and skin involved. Stitches are very prone to ulcerate out, or to cause irritation, which induces the dog to attempt to tear them out by biting and scratching, thereby further injuring the part and retarding the process of healing. Bandages, too, are not well tolerated by dogs, and when they become soiled and dirty are worse than useless.

In most simple wounds of recent origin which are not particularly dirty, one of the simplest and most efficient applications consists of tincture of iodine, or Lugol's solution of iodine diluted with clean boiled water, in the proportion of one teaspoonful to the pint. This may be applied, without previous washing, over the abraded surface by means of a soft brush or cotton wool, and will materially assist in preventing the wound from suppurating (festerer).

In the case of large wounds which have become much soiled, the dirt may be removed by washing in warm water containing a little antiseptic, such as Jeyes' fluid, afterwards lightly dusting the injured surface with powdered boracic acid. When bandaging appears necessary a cotton-wool pad dusted with boracic acid may be applied and

the bandage adjusted over this. If stitching has to be resorted to care should be taken to thoroughly boil the needle and thread before use, and to put in only as many stitches as are absolutely necessary to bring the lacerated parts together and ensure their proper support. Only properly prepared surgical silk or catgut ought to be employed for this purpose.

Loose or torn claws may be nipped off with a pair of sharp scissors, the part being subsequently dressed with some non-irritating antiseptic such as boracic acid.

In case of severe bleeding from an injured blood-vessel the bleeding end should be sought, caught up, held with a pair of thoroughly clean fine pliers or forceps, and tightly squeezed so as to stop the escape of blood, when very soon, on relaxing the pressure, the bleeding will, as a rule, be seen to cease. If the particular vessel involved cannot be observed, then pressure should be applied by means of the finger or a pad kept in position by a tight bandage upon the main blood-vessel above the seat of injury in case of an artery, or below if the bleeding proceeds from a vein, the latter being easily distinguished by the slower, more regular flow and darker colour of the blood. The large blood-vessels of the extremities are, generally speaking, situated on the inner surface of the leg under the forearm or thigh.

In connection with the application of antiseptics, it should be borne in mind that dogs are particularly susceptible to the absorption of poisonous substances through the skin or from a cut or abraded surface, so that only comparatively non-poisonous dressings should ever be applied; carbolic acid, in any form, should not be used as an application for dogs, on account of its poisonous properties. As a rule, dry dressings, in the shape of powder applied after previously cleaning the wound, are preferable to lotions. A dressing composed of boracic acid 1 part, iodoform $\frac{1}{2}$ part, and starch-powder 10 parts, is of general usefulness for this purpose, and will, moreover, assist in keeping flies away from an open wound or ulceration during summer-time. Cleanliness, however, is the essential factor in the healing of wounds, and, if this can be assured, probably the less antiseptic applied to the injured surface the better will be the result.

Treatment of Fractures.—The setting of a fractured limb calls for an accurate knowledge of the anatomy of the injured part, and therefore in such cases, whenever possible, the services of a properly qualified veterinary surgeon should be requisitioned. If such be unobtainable, or pending the arrival of the surgeon, the broken limb should be gently extended and carefully compared with the corresponding leg of the opposite side, in order to note any discrepancy in regard to length and regularity of conformation. An improvised splint made of stout cardboard padded with cotton-wool may then be applied

along the full extent of the leg, and more cotton-wool placed round the limb, the whole being kept in position by means of a plaster-of-paris bandage. These bandages are obtainable at any chemist's shop, and should be kept on hand by all farmers in case of accidents of this nature. They only need soaking for a few minutes in cold water before being applied. The bandage soon sets into a hard mass, maintaining the leg in a perfectly rigid condition. A month to six weeks is the usual time necessary to allow the fractured bone to properly set, and the splint ought to be kept on throughout this period. A light coating of tar, or, better still, a solution of aloes, applied over the outside of the bandage, will effectually deter the dog from attempts to remove it with his teeth.

INJURIES TO THE MOUTH AND TEETH.

These sometimes occur, especially in older animals when the teeth become unduly worn or decayed, in which case it may be necessary to extract the particular teeth involved. Very great care must be taken to extract the whole of the tooth, as in such cases it sometimes happens that the tooth is broken off, the stump being left in the gums to cause further trouble later on. Whenever possible it is better to leave such operations for the qualified veterinary surgeon to perform.

Wounds of the mouth, as a rule, tend to heal rapidly; it is only necessary to see that they do not become receptacles for food or other matter which might lodge in them; and, if the wound is of such severity as to prevent the dog from eating, soft food or milk should be given until such time as the animal can resume its normal diet.

CANKER OF THE EAR.

Disease of the ear, due to the entrance of a small animal parasite which flourishes amid dirty conditions, is sometimes encountered. This parasitic infection of the ear causes intense discomfort, evinced by the dog continually shaking his head, which is frequently inclined to one side.

Wounds and ulceration of the skin in proximity to the diseased ear often follow as a result of self-mutilation, inflicted by the animal in attempts to relieve the irritation caused by the movements of the parasites by scratching at the spot with the hind foot. The irritation is always more noticeable during warmer weather, or if the animal be lying in the sun or before a fire, the warmth having the effect of arousing the parasites to their full activity. If the inside of the ear be carefully examined, there will be seen, amidst an accumulation of dirt and débris, numbers of minute moving specks. These are the parasites responsible for the trouble. Treatment consists in thoroughly

cleansing the interior of the ear, and for this purpose a little methylated spirit and warm water, in the proportion of 1 in 10, is most serviceable. This should be applied by means of a small mop, made by twisting cotton-wool around the point of a penholder. The ear must be thoroughly swabbed out and all the dirt removed. Subsequently a little of the following liniment should be dropped into the ear and the flap held down for a few minutes to prevent its escape, while gentle kneading movements are made with the hand to aid the thorough distribution of the application: Nitrate-of-mercury ointment, 1 dram; olive-oil, 1 ounce: mix well.

Neglect of parasitic disease of the ear sometimes leads to serious consequences, and the dog cannot be expected to properly attend to the work in hand when suffering in the manner described.

SKIN-DISEASES.

The discussion of this subject has been left until the last because, according to my experience, dogs employed on sheep and cattle farms rarely suffer from diseases of the skin, although these are frequently encountered in other breeds kept as house dogs or pets. The reason for their apparent immunity in this respect results, I consider, from the fact that sheep and cattle dogs are nearly always in hard condition, obtaining plenty of exercise, and, above all, have natural food in the shape of meat.

Eczema.—Of all diseases of the skin to which dogs are susceptible, eczema certainly takes the foremost place. This is an irritating form of trouble accompanied by eruptions or small vesicles forming patchy areas on different parts of the body, but particularly under the forearms, underneath the belly, and in other situations where the skin is readily scratched by the animal. Eczema is a non-contagious affection, seemingly due to digestive disturbance occasioned by improper feeding, chiefly overfeeding with too starchy food accompanied by insufficient exercise. These conditions do not apply in the case of dogs of the class to which this article particularly refers, and this probably accounts for their freedom from this trouble. Eczema is frequently confounded with mange, and, in fact, is commonly called by the latter term. The two diseases are quite distinct in their origin and course.

Eczema should be treated as a constitutional disorder. The bowels require regulating by small and repeated doses of calomel—1 to 4 grains; the diet should be properly adjusted, and should consist principally of meat. The local irritation is best relieved by application of compound sulphur ointment. Mange requires local treatment only. Application of sulphur ointment, which should be removed every

third day by thorough washing in warm water containing a little soda and a very little Jeyes' fluid, will usually effect a cure.

Mange is a purely contagious form of skin-disease caused by a minute animal parasite. It is not often seen in dogs which are well fed and kept in good condition, and therefore does not call for any special reference here.

Though this article has not perhaps dealt so fully with the various ailments of dogs as the subject deserves, it is hoped that its perusal may have the effect of increasing the general knowledge of farmers and others concerning the treatment of their dogs when necessity arises.

During May four parties visited the Moumahaki Experimental Farm—eighty members of the Eltham branch of the Farmers' Union, thirteen members of the Rapanui branch, fifty members of the Stratford branch, and twenty farmers from Normanby.



COMEBACK WHEAT GROWN BY MR. WARRINER AT GREATFORD.

This wheat was introduced by the Department in the same year as Federation. It is a hard, good milling variety. Over thirty bushels per acre should be secured on most soils.

[Photo by G. de S. Baylis.]

SHEEP-DIPPING

THE sheep-owner who has regard for the health of his sheep and is anxious to make a good profit from his industry would do well to see that his dipping operations are really effective and that the sheep are free from vermin. There is even yet time to dip if there is any reason to believe the flock is not clean. The work should, however, be done in fairly settled weather.

FATTENING LAMBS.

A MOUMAHAKI EXPERIMENT.

T. W. LONSDALE.

SINCE a larger proportion of the sheep in this country are yearly being fattened on forage crops, both student and farmer are interested in the cultivation of all crops which are conducive to rapid fattening. Numerous plants are adaptable to this purpose, but probably rape has for many years been considered pre-eminent, yet we have no authentic evidence on this point. Many trials have been carried out in various parts of the country, but these have chiefly been to ascertain the yield per acre of the respective plants.

An interesting experiment in feeding lambs has recently been conducted on the Moumahaki Experimental Farm, the object of which was to compare the feeding qualities of different varieties of forage, a field of several acres being devoted to rape, silver-beet, maize, and Buda kale.

On the 29th March a draft of 182 lambs was apportioned according to the area occupied by the respective crops. Each lot was weighed and marked with a distinguishing-mark, so that in the event of individual lambs straying on to other plots the matter could be easily and immediately rectified. The lambs were then turned on to separate plots, and remained on the crops for a period of eighteen days.

To a casual observer the general appearance of the lambs on rape, silver-beet, and maize plots was similar throughout the trial; but it was evident that those feeding on Buda kale were not fattening rapidly. At the conclusion of the trial the lambs were again weighed, the average gain per lamb for the period being as follows: Rape, 7.3 lb.; silver-beet, 6.4 lb.; maize, 5.9 lb.; Buda kale, 2.4 lb.

The results obtained from the Buda kale are disappointing; yet, considering that the daily gains made by the lambs fed on rape, silver-beet, and maize are phenomenal compared with the kale-fed lot, it must not be inferred that Buda kale is of low feeding-value. Probably there may have been some factor which detracted from the value of the last-named crop; and the fact that the results of this trial show such a marked variation points to the futility of regarding the results of one or even several trials as conclusive.

With regard to silver-beet, a point worthy of note is that when lambs are fed on this forage only they are liable to scour; and it is quite possible that if some other forage, such as mustard, is fed with the silver-beet the gain in weight would be considerably higher.

FIELD OR HORSE BEAN.

T. W. LONSDALE.

A CROP which has received less attention than it merits in many parts of the Dominion is the common field-bean. This legume is used largely in England for stock-feeding, and takes a prominent place in the rations of draught horses. Being rich in protein, beans are especially suitable for this purpose, and a combination of beans and oats forms ideal food for horses which are daily performing heavy work. As a result of feeding-experiments with horses in America it was found that 3.5 lb. of beans are equivalent to 4 lb. of oats, and from this we may safely infer that the crop is worthy of consideration. The field-bean is not only useful as food for horses, but is almost equally valuable for other animals.

Like all legumes, it is a soil-renovator, as it adds materially to the nitrogen-content of the soil. The bacterial development which appears on the roots of the plant prove conclusively its value in this respect. The crop is regarded in many countries as a cleaning or preparatory crop, and is frequently grown on the most weedy portions of the holding, invariably leaving the land in an improved condition.

When sown on the flat field-beans can be cut with the binder. The stooks may remain in the field for an indefinite period, the crop being easily threshed from the stook. Should climatic conditions make harvesting impossible the crop may be advantageously consumed on the land by pigs, or converted into ensilage, and is also valuable as green manure.

The accompanying photographs show a crop growing on the Moumahaki Experimental Farm, and the bacterial nodules on the roots. The seed was sown during the early part of October, at the rate of $1\frac{1}{2}$ bushels per acre, the manure employed being basic slag (4 cwt.), and sulphate of potash (56 lb.). The crop when threshed yielded 48 bushels per acre.

It is expected that the cultivation of the Soya bean will be taken up largely in Ceylon, for besides its value as an article of food it can be exported to the European and American market.—*Bulletin of the International Institute of Agriculture.*



THE BEAN CROP AT MOUMAHAKI EXPERIMENTAL FARM.



THE ROOTS OF TWO PLANTS IN THE MOTMAHAKI BEAN CROP, SHOWING THE GOOD DEVELOPMENT OF BACTERIAL NODULES.

RABBIT-DESTRUCTION.

FUMIGATION WITH BISULPHIDE OF CARBON.

A. CLARKE.

THE destruction of rabbits by means of poisoning with bisulphide of carbon has been proved to be absolutely effective, where the conditions are favourable, in the Queenstown district. The low-lying, or farming, portion of the district is of a broken ridgy nature with numerous small gullies, which could not be ploughed when the land was broken in. In most cases these have become simply rabbit-warrens. They constitute the breeding-ground, and it is here where the supply of rabbits is maintained year after year. Thus, no matter what diligence may be exhibited in the work of poisoning and trapping, so long as the supply of stores is left untouched, sufficient rabbits are being bred in these warrens to restock the countryside with the vermin. A thorough clearance of the warrens, it will be conceded, is the only means of fighting the pest with success. A farmer of the district who has proved this to be the case, having fumigated the burrows with bisulphide of carbon, is Mr. R. M. Paterson, of Ayrburn Estate, Arrowtown. After dealing with all burrows on his property in a thorough manner he now enjoys the satisfaction of seeing his land practically clear of rabbits. Writing of his experience, Mr. Paterson says: "When you first came to this district you told me that carbon-bisulphide would soon put down the rabbit pest if used properly, and acting upon your advice I got a supply of carbon and gave it a trial. I have now used £116 worth of carbon-bisulphide on Ayrburn (area, 2,100 acres), and the cost of labour was £125 or £241 for going over the ground twice. In addition to this amount I spent £100 in repairing the netting fences, so that each block was securely fenced when the men started to fumigate. I am sure this work will not cost one-fourth to do next season, as the breeding season has now practically ceased, and I cannot get a man to trap for 1s. per skin, as I have offered this amount to trappers and have been refused. My reason for wanting to get trapping done was that I could not get any carbon, as the railway will not carry it at this season of the year. I am sorry to say for the last five years before this one I have not taken less than 28,000 rabbits by trapping alone; and at the end of

each season I did not have the satisfaction that I have now of seeing the place practically clear of rabbits."

The total cost of carrying out the work [in Mr. Paterson's case seems somewhat large; but when the £100 spent in repairing and renewing rabbit-proof fences is considered as improvements to the property the total account should only be debited with £241, which will be seen to be a gratifying reduction in the cost of fighting the pest—which in previous years meant the payment of 2d. per skin for 28,000 rabbits—to say nothing of the feed consumed by the rodents. On this showing, the value of the estate in question, through the present methods being followed out, must be considerably increased.

Some twelve to fifteen other farmers have since adopted the fumigation process. The results, where care and attention as to the use of the material were given, were an undoubted success. On going over his property with me the other day a farmer pointed out a small area which, had it not been fumigated, he calculated would have been carrying 2,000 rabbits by now.

The chief drawback to the use of bisulphide of carbon is its cost. Notwithstanding this, the farmer will undoubtedly find fumigation the cheapest and best method of fighting the pest in the long-run. In any country where the burrows are accessible bisulphide of carbon will, if properly used, not only effect a reduction in the pest, but will practically make a thorough clearance.

WEST CANADIAN MARKETS.

SOME shippers of New Zealand produce to the markets of Western Canada are failing to use the form of invoice approved by the Canadian Customs, the use of which is necessary to secure the preferential treatment granted this country under the Customs tariff of Canada. This, reports the New Zealand Trade Representative in Vancouver, is causing annoyance and expense to Canadian importers of New Zealand produce. Copies of the correct Canadian invoice form may be seen at the office of the Department, Customs Building, Wellington, or at the Chambers of Commerce, Auckland, Napier, New Plymouth, Wellington, Christchurch, and Dunedin.

A draft of crossbred ewes for breeding purposes was purchased this season for the Moumahaki Experimental Farm. A number of these were culled and are now being fattened; the balance have been mated with South-down and Dorset Horn rams. The rams of these breeds will later be superseded by Border Leicesters. A draft of purebred Lincoln ewes has been purchased and mated with a Ryeland ram.

A CANADIAN AYRSHIRE.

THE accompanying illustration is that of a Canadian pedigree Ayrshire cow, Eileen, which has put up the following fine records: 1910, 11,025 lb. of milk, averaging 4.74 per cent. of butter-fat, or a total of 523 lb. of butter-fat in the season; 1911, 13,825 lb. of milk, averaging 4.59 per cent. of butter-fat, or a total of 635 lb. of butter-fat. Eileen had a rest between these two records of forty days. Thus in the two seasons she produced 24,850 lb. of milk and 1,158 lb. of fat. In forwarding this record at our request, Mr. G. D. Mode, of Vankleek Hill, Ontario, the owner, says: "This is not a forced record, but a record under ordinary conditions. During the period Eileen dropped a fine healthy calf every year since she was three years old.



EILEEN, A CANADIAN UTILITY AYRSHIRE.

In the fertile province of Santa Fe (Argentina) the dairy industry is expanding. There are seventy-three skimming-stations, six butter-factories, six cheese-factories, and fifteen dual-purpose establishments. The industry is carried on by German and Swiss colonists.

MILKING - MACHINES .

HOW TO CLEAN THEM.

C. STEVENSON.

WHILE carrying out my work of instruction at dairy farms and factories during the past season I was much impressed with the fact that a large percentage of the inferior, badly flavoured milk delivered to the factories was directly due to the unsatisfactory condition in which milking-machines are maintained. On several occasions I was specially called to factories in order, if possible, to arrive at the cause of deterioration in the quality of the milk-supply; and in almost every case I was able, with little difficulty, to trace the trouble to unclean, badly kept milking-machines.

The position in regard to poor-quality milk is serious for all concerned. Whether the milk is returned to the supplier, or is accepted at the factory and manufactured into butter or cheese, the result must be a loss to the farmer, to the company he supplies, and to the industry generally. Again, when we consider that the milk drawn through one of these neglected or imperfectly cleaned machines is quite sufficient to contaminate the whole of the milk in a cheese-factory vat—as much as 8,000 lb. in quantity—the injustice to those farmers supplying good milk is at once evident.

As the one remedy whereby the great loss referred to may be obviated is the proper cleansing of milking-machine parts, as, indeed, of all utensils used in connection with milk, it is well that a practical understanding of the position, especially of the best means of cleansing the rubber parts of mechanical milkers, should be brought home to those concerned.

The first essential in all cleansing work is a plentiful supply of good water. Provision should be made for this at every milking-shed, more especially where milking-machines are installed. Some means of heating water is also necessary. The practice often followed of taking home sufficient hot water from the factory for washing purposes is not advisable, and this for various reasons. In the first place, such water is generally practically cold on arrival at the farm. Again, a milking-machine should be washed immediately after the work of milking is completed, and this cannot be done unless really hot water

is on the spot. To leave the tubes and parts unwashed until the return of the milk-wagon from the factory permits the milk to dry on the inside of the tubes. Effective cleansing is thereby made almost impossible. Two tubs or troughs should be provided. The machines should be washed in one, and soaked, after washing, in the other. These tubs should be about 3 ft. 6 in. long, 12 in. wide at the bottom, and 15 in. deep. I have seen a man endeavouring to wash a milking-machine in a bucket of water—an almost impossible task.

Immediately milking is finished the tubes should be rinsed by having cold water drawn through them. All tubes, inflations, &c., should then be taken apart and placed in a tub of fairly hot water, to which should be added a quantity of any reputable cleansing-preparation. These parts should then be thoroughly cleansed. The brushes supplied for this purpose by the makers of the machines are quite suitable, but care should be taken not to keep them in use too long. I have seen some brushes in use when quite worn out, being little more than a piece of wire to which the brush had been attached. A stock of these brushes should be always on hand.



SHORTHORN TYPES : TWO OF THE PURE-BRED MILKING ILLAWARRA SHORTHORN COWS
FROM NEW SOUTH WALES AT THE WERAROA EXPERIMENTAL FARM.

After the parts in question have been thoroughly washed they should be placed in the second tub and completely covered with clean, cold water to which has been added a handful of lime. The parts should be left to soak in this until just prior to the next milking, when they should be rinsed with cold water before being put together.

It is advisable to have a separate room attached to the shed in which the machines can be washed and where the tub used for soaking can be kept. If no separate room be available the tub in which the parts are soaking should be placed outside the milking-shed.

The machines should be washed as described above every morning. *The water used for soaking purposes should be renewed daily.* After the evening milking all parts with which the milk has been in contact should be well rinsed, first with cold and finally with warm water.

In addition to the above treatment all tubes and other rubber parts should be well boiled at least twice a week. For this purpose, as well as for providing a supply of hot water, I would again emphasize the necessity of having a boiler of some sort at or near the milking-shed.



TWO PURE-BRED NEW ZEALAND SHORTHORN HEIFERS OF A DAIRY STRAIN
AT THE WERAROA EXPERIMENTAL FARM.

Much difference of opinion exists among users of milking-machines regarding the effect of boiling upon the rubber. Many contend it is injurious. I am convinced, however, that, if the treatment is commenced when the parts are new and in good order, the tendency is for the boiling to preserve, rather than to injure, the rubber. From the point of view of cleanliness there can be no question regarding the advantages of boiling.

A common mistake in regard to the rubber parts of milking-machines is that they are kept in use altogether too long. I have seen some parts, particularly milk tubes and inflations, so badly perished and impregnated with stale milk as to render thorough cleaning an impossibility. The only remedy in such cases is, of course, to provide new parts.

Vacuum tanks and pipes which have been allowed to become dirty have been frequently a cause of bad milk. In order to keep these clean a strong solution of warm water and soda should be drawn through the pipes and into the vacuum tank daily. This solution should then be immediately drawn from the tank. The tank should be left open between milkings, in order to permit the admission of fresh air to it.

In the case of milking-machines having automatic releases attached, the pipes conveying the milk should be taken down and thoroughly cleansed daily with a brush.

The milk-buckets should be thoroughly washed and then scalded with either steam or boiling water. They should then be placed on a rack erected for the purpose, outside the milking-shed, in such a position that any water remaining in them may drain away, and that fresh air and sunlight may be freely admitted.

This method of cleaning milking-machines, while being thoroughly effective, is very simple, and will, I feel sure, if generally adopted, do a great deal towards improving the quality of the milk-supply at many factories.

The progress of stock-breeding is one of the leading agricultural facts of Germany. With the growth of the population the demand for meat has risen. Germany ranks next after Great Britain and the United States as a meat-consuming country. It is also interesting to note that the number of swine has constantly increased, while that of sheep has declined. It is also recognized that the total dairy-production exceeds in value that of the cereal crops.

SOFT-CHEESE MAKING.

COULOMMIER.

MISS G. NEST DAVIES, N. D. D.

COULOMMIER is a French cheese, called after the district in France where it is chiefly made. It is a small, flat, round cheese measuring $5\frac{1}{2}$ in. in diameter, and about $1\frac{1}{2}$ in. in thickness, and weighing from 12 oz. to 16 oz., according to age. In England it is usually eaten fresh—*i.e.*, from three to five days after making; but many people prefer it two or three weeks old. If kept over a week it will be more or less mouldy on the outside, and the curd will be more mellow.

Of soft cheeses it is one of the simplest to make, and at the same time one of the most profitable, only half a gallon of milk being required to make a cheese.

PROCESS OF MANUFACTURE.

The temperature of the making-room is best from 68° to 65° Fahr. Sweet, clean, new milk of good quality should be used. Strain into a clean pail or wooden tub, and regulate to a temperature of 80° to 85° Fahr. Add 1 c.c. of rennet to every 3 gallons of milk; but first dilute the rennet with ten times its bulk of water, in order to get it evenly mixed. Stir well into the milk for three minutes; then after leaving for ten minutes stir again, chiefly on the surface, for a few minutes in order to prevent the cream from rising. Do this every ten minutes for the first half-hour. It is very important not to stir once coagulation has commenced, or a great loss of fat will take place in the whey. Cover the vessel with a clean cloth in order to retain the heat. If the temperature of the room is low it is advisable to set the vessel containing the milk in another containing water a couple of degrees higher than the milk. Leave for two and a half to three hours, or until the curd will split cleanly on the thermometer or finger.

The Coulommier mould is made in two pieces, a collar being made to fit into the lower half of the mould. When fitted together the mould measures 5 in. in height and $5\frac{3}{4}$ in. in diameter. Place the boards, with straw mats on them, and the moulds, where they can drain undisturbed, and ladle the curd from the tub or vessel into them. A large ladleful of curd should be taken from the top of the

tub and set on one side, to form smooth tops for the cheese. Great care should be taken in ladling out the curd to prevent unnecessary loss of fat, as, if ladled roughly, the result will be a dry, harsh cheese. It should also be remembered that the thinner the slices of curd taken the quicker will be the drainage.

After the moulds are filled, leave to drain until the curd has sunk to the lower edge of the collar, or nearly half-way down the mould, which should be in about ten hours; then remove the collars, place a clean mat and board on the top of the moulds, and turn them over. Great care is necessary in removing the first mat, as the curd is apt to adhere to it. It is always best to roll it backwards. Sprinkle on the top of each cheese $\frac{1}{4}$ oz. of good finely ground salt. The next morning, or in twenty-four hours, turn again, and sprinkle the other side with a similar amount of salt; afterwards turn twice daily.

Coulommier cheese if consumed fresh is ready for sale in from three to five days, or as soon as sufficiently drained and firm enough to retain its shape after the mould has been removed. However, if the cheeses are to be ripened they should be kept in a dry airy room for a few days, then taken to the ripening-room and placed on straw-latticed shelves.

They are sold retail at Home at 8d. and 9d. each. Wrapped in butter-paper and packed in a cardboard box the cheese presents a favourable appearance.

Spain remains an agricultural nation. Perhaps in no other country in Europe is there so large a population of persons engaged in agriculture as in Spain. According to the latest statistics of seven million Spaniards whose occupation is known only $3\frac{1}{2}$ per cent. are engaged in manufactures, while agriculture occupies 70 per cent.

The total value and value per head of population of the external trade of the Commonwealth for the year 1911 was as follows: Total trade, £146,344,573; of these figures the imports totalled £66,860,303 and the exports £79,484,270. The value per head of the total trade was £32 12s. 4d.; of imports £14 18s., and exports £17 14s. 4d.

It is interesting to note that in the September quarter of 1911 the exports of British produce to Argentina amounted to £5,366,000, in comparison with £4,790,000 in the corresponding quarter of the previous year, and that, on the other hand, our imports from Argentina were valued at £5,379,000, against £7,670,000 in the previous year. Thus, whereas in the last quarter of 1910 our imports from that country exceeded our exports by nearly £3,000,000, in the last quarter of 1911 the exports and imports were just about equal.—*The Statist*, 17th February, 1912.

BUTTER AND CHEESE QUALITY.

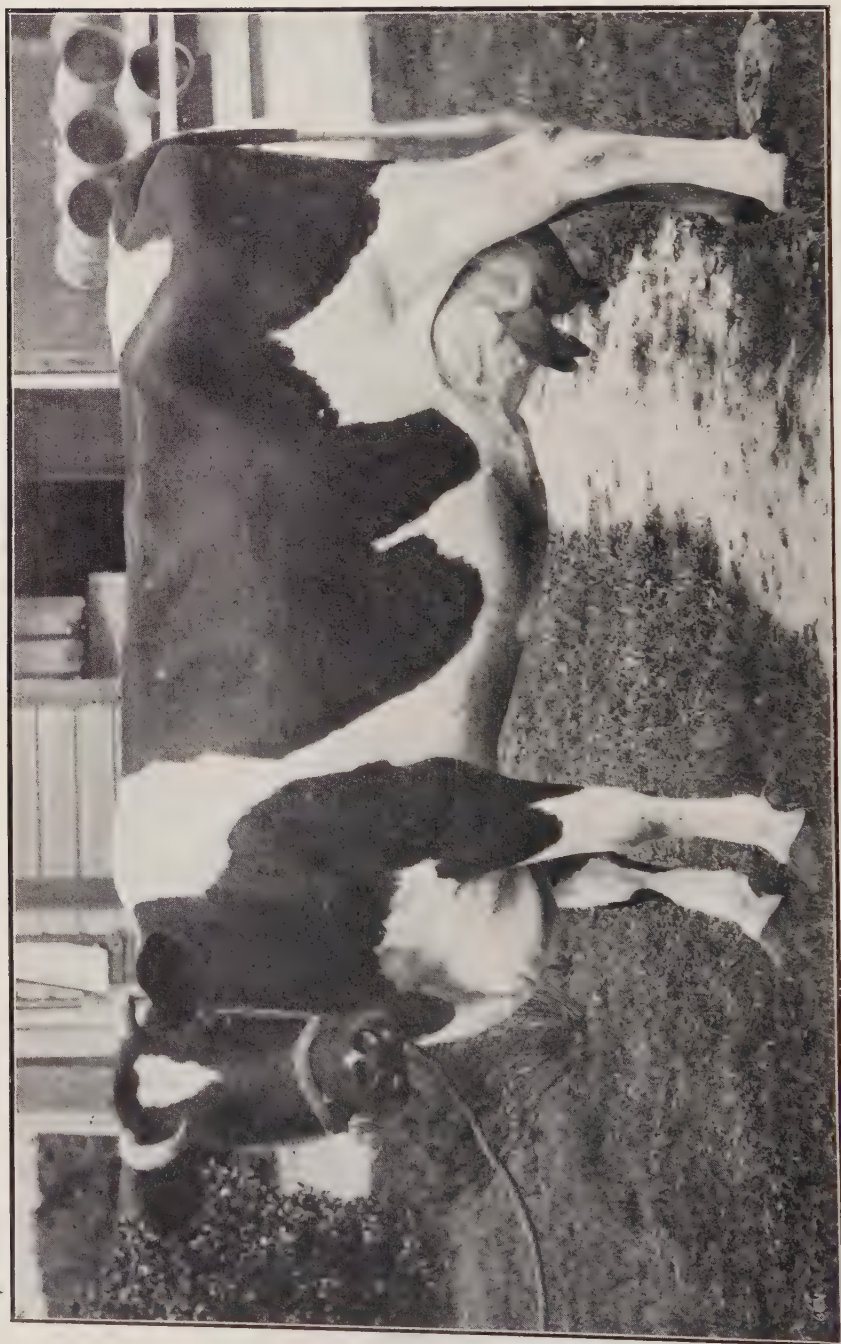
D. CUDDIE.

THE quality of the butter of the past season has been of a gratifying character, a solid advance having taken place in the manufacturing process. British market opinion has borne out the good impression of the graders at this end. The chief reason for the improved quality has been the adoption of pasteurization by the majority of factories. Butter made under this process is of better flavour, is more uniform in quality, and has a longer-keeping character than butter manufactured from unpasteurized cream. So positive are the good results obtained by pasteurization that it is being generally recognized that its adoption is practically indispensable if a high-quality butter is desired.

Assisted largely by the cool weather, the bulk of the cheese manufactured during the past season has been sound in flavour, and has presented the desirable characters of a well-made article. The good effect of cool weather conveys an important lesson to milk-producers in regard to the necessity of cooling milk if a sound and choice article is to be manufactured. While much of our cheese this season has been of a satisfactory standard, it is to be regretted that a good many brands have exhibited a poor flavour, while in some cases an openness of body has been exhibited. Failure of the milk to be delivered in a clean and sound condition is the main reason for these defects, though in the latter case the cheese-maker has the remedy largely in his own hands. On the whole, the great danger to the cheese industry of the Dominion is inferior milk.

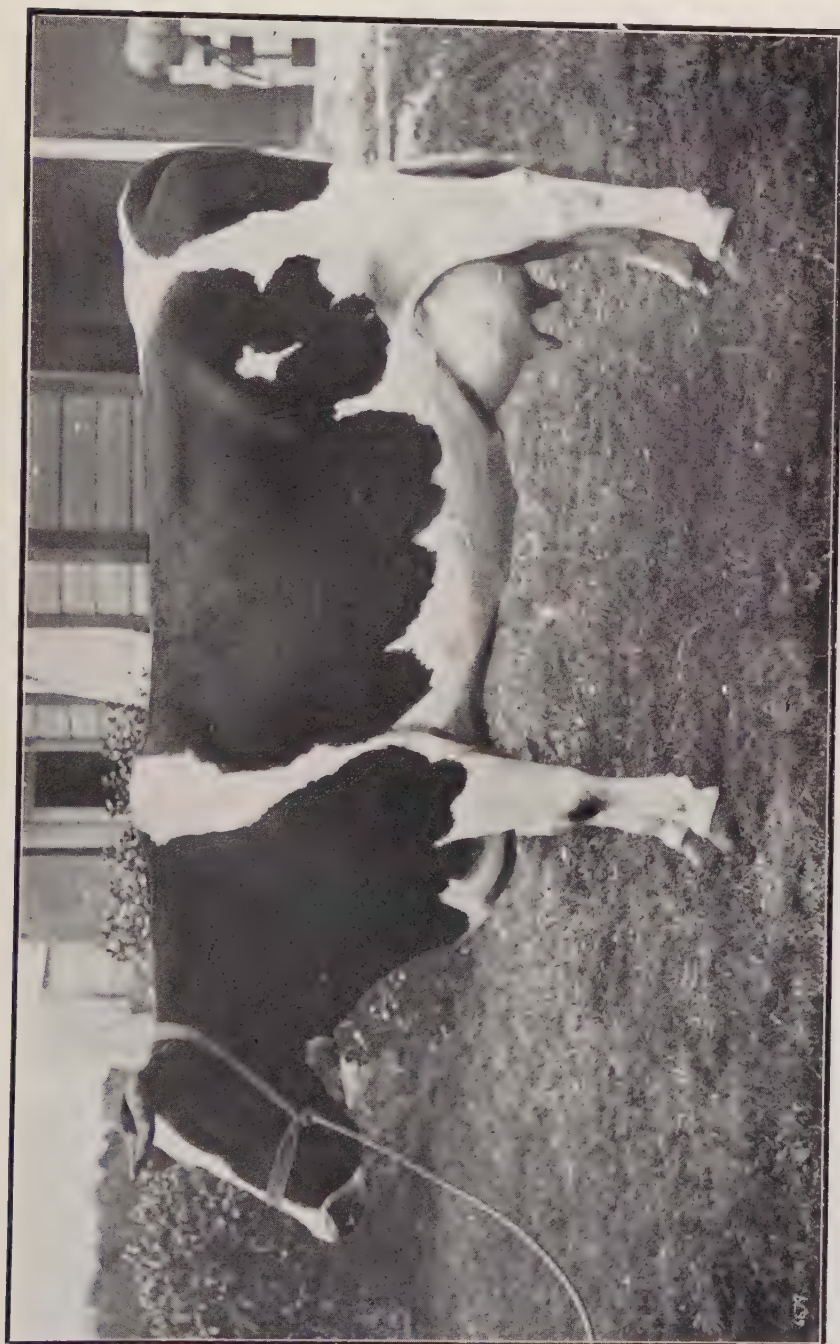
A feature of the winter-show displays of the Department this year is the special exhibits of the Dairy Produce Division. These include models of cow-sheds, plans of sheds, samples of milk-constituents, casein, milk, sugar, and soft and fancy cheese.

Belgium has many important syndicates for the improvement of goats, designed to provide their members with first-class milk-giving goats and placing at their disposal choice he-goats for selected stock. There are over four hundred of these goat syndicates in Belgium, having 40,260 members, who are the owners of 48,505 goats.



DOMINO III.

A member of the Weraroa Holstein herd. Her yield from date of calving, 5th September, 1911, to 31st May, 1912, was 18,445 lb. of 3.5 milk, or 645.5 lb. of fat. Highest day's yield, 113½ lb. Present yield per day, 52 lb. During the season Domino III suffered from foul-foot, and subsequently was seriously ill, these troubles materially affecting her yield. She was fed solely on pasture. At 1s. 0½d. for butter-fat her yield represents £33 10s.



SPOT.

A member of the Weraroca Holstein herd. Her yield from date of calving, 8th August, 1911, to 31st May, 1912, was 13,927 lb. of 4·2 milk, or 584·9 lb. of fat. Her present yield is 35 lb. a day. At 1s. 0½d. for butter-fat her yield represents £30 9s. 2d.

CULLING DAIRY COWS.

SHOULD QUALITY BE CONSIDERED WITH QUANTITY?

W. M. SINGLETON.

SOME dairy-farmers who consider themselves leading lights in their respective districts, and who do not care to fall in with the Cow-testing Association movement, excuse themselves, or believe they do, by stating that to test for butter-fat is unnecessary, and that a consideration of quantity is sufficient. It may be wagered that in about nine cases out of ten when a man talks in this strain he is not even weighing the milk from his individual cows. As a rule, those who have had some experience in weighing the milk of their individual cows are those who are most anxious to include the tests for fat as well as those for quantity.

The cows illustrated on the opposite page evidence the error which may be committed in culling on quantity alone. Cow No. 1 had a comparatively high test; and, although her yield of milk is below that of the average cow tested last season, her butter-fat production is as much as 127 lb. above the average. On quantity of milk only she would probably have been culled while many a more inferior cow would have been retained in the herd. This demonstrates the fact that intelligent culling can only be done as the result of knowledge obtained through weighing and testing the milk from each individual cow in the herd. Although cow No. 2 produced 3,611 lb. of milk more than No. 1, her yield of fat was 96 lb. less.

CLUB-ROOT.

EXPERIENCE of the past season in connection with the co-operative root experiments in the South Island disclosed an interesting fact in regard to club-root disease. Twenty-seven varieties of swede turnips were sown on thirty-five farms. As far as can be ascertained the only cases in which club-root have appeared have been in seed from the one source, and the trouble appeared on several farms using the seed in question. This would appear to show that the trouble actually came in the seed. All the co-operative turnip plots are to be carefully examined in order to discover if the above experience is general.



Cow No. 1.



Cow No. 2.

THE WINTER SHOWS.

THE pioneer winter show of the Dominion, that of the Otago Agricultural and Pastoral Society, maintains its high standard of excellence. That held in the special and very suitable buildings of the society at Dunedin last month, and opened by the Prime Minister and Minister of Agriculture, the Hon. T. Mackenzie, was an exhibition worthy of the province and the industries the show is designed to foster. Again the factory butter and cheese competitions were largely patronized, and were conspicuous by the gratifying fact that never before had finer quality in both products, especially of butter, been placed before the experts at Dunedin. The art of modelling artistic designs from butter is apparently confined to the ladies of Otago. The farm root displays were particularly fine, though the mangels were not as good as in former years, the season not affording sufficient sunshine to secure the desired development. Though better displays of fat stock have been seen at Dunedin, the sheep section included many fine pens, even if some were on the coarse side and were not as well matched as they should have been for exhibition purposes. The feature of the Department's display this year was the very instructive array of exhibits from the southern co-operative experiments of the past year. The collection of roots grown by the co-operating farmers, very well staged and properly described, was probably the best exhibition of roots yet seen in this country. Fruit, mainly apples, received greater attention this year, both the competitive classes and the educative exhibits of the Department providing a good advertisement as to the suitability of some parts of the Dominion for fruit-culture.

The winter shows at Hamilton, New Plymouth, Invercargill, and Hawera were also highly creditable displays of the products of the farm, dairy, and orchard, varied, as at Dunedin, with industrial and commercial displays. At each show the Department staged large instructive displays. The clashing of dates, all the winter shows of this year having been arranged for June, has made a very heavy demand on the resources of the Department. This absence of co-ordination was referred to at the Dunedin show by the Prime Minister and Minister of Agriculture, the Hon. T. Mackenzie, and Mr. E. Clifton, who controls the winter-show displays of the Department. In the first week of June the Department had to provide three large exhibits instead of being able to concentrate its energies on the one display. Under the circumstances not only was the cost to the Department considerably augmented, but the representative and educative character of the displays was impaired.

APPLE - PACKING .

THE PRACTICAL WORK EXPLAINED.

J. H. THORP.

IT is my intention to set forth in as practical a way as possible what I consider to be the best method of packing apples, and for the purpose of illustration, I have wrapped and packed cases of various sizes of apples, which are reproduced here, these being photographed first from the top of the case and then from the side, thus showing the method by which the different grades are packed. The system here adopted is the pocket pack, the success of which is largely dependent on careful grading, as each tier must contain the same number of apples. In wrapping, the packer must know beforehand how the apple is to be placed in the case; for instance, if stalk end down it should be taken up with the left hand while the paper is taken up with the right, placing the calyx end of the apple in the paper, the loose ends being gathered together to form a pad, on which the apple rests when put in the case. If packed on the side the apple must be placed in the paper on its side, so that the gathered ends of the paper may form a pad, as in the previous instance.

The apples are graded into the following sizes: 2 in., $2\frac{1}{4}$ in., $2\frac{1}{2}$ in., $2\frac{3}{4}$ in., 3 in., and $3\frac{1}{4}$ in.; but it will be readily understood that the apples in each grade must vary at least an eighth of an inch each way. It would be impossible to have every apple exactly the same size, as this would entail altogether too much grading to be practicable.

I shall now deal with the method of packing adopted for the cases in the photographs herewith. The first shows the top of the case, and the second one the same cases opened on the side. The cases used are dump cases, measuring approximately $8\frac{3}{4}$ in. by $14\frac{1}{4}$ in. by 18 in. inside measurement. The apples in the first case on the left of the plate are 2 in. in diameter, and are packed on what is called the three-two system—that is, the apples are placed one in each corner and one in the middle, leaving spaces between; and the next two apples are placed in the spaces, but which it will be observed are not large enough to allow them to slip right in. The apples are placed alternately in this way until the tier is full. The second tier is then packed into the pockets formed by the first tier, and so on until the case is full. By reference to the first case, in the bottom row of Plate II, the reader will see the result; the apples, instead of being directly on top,



THE APPLE PLACED IN THE PAPER HELD IN THE RIGHT HAND.



THE PAPER GATHERED BETWEEN THE THUMB AND FIRST FINGER OF THE LEFT HAND.



SHOWING THE PAD FORMED BY THE ENDS OF THE PAPER.

of each other, as they would be under the square-pack system, are each lying in the pockets formed by the apples in each preceding tier, of which there are eight, each containing 35 apples, making 280 apples to the case.

The second case is packed with $2\frac{1}{4}$ in. apples under what is called the two-two system—that is, the apples are packed in twos; the first apple is put in the corner of the case, and the second at an equal distance between the first and the other corner, so leaving spaces for the next two, and so on until the tier is full. By reference to the second case in bottom row of Plate II the result will be seen. the apples, as in the previous case, lying nicely in the pockets. In this case there are only seven tiers, each containing 36 apples, the case totalling 252. The apples in this case are graded too closely to $2\frac{1}{4}$ in. With a little more variation apples of this grade can be packed on the flat instead of on the side, the case then containing about two dozen apples less; but a good deal will depend on the thickness of the apple whether the case will fill up quite level. With a little practice the packer will soon find which style suits the different varieties best.

The third case contains $2\frac{1}{2}$ in. apples, and is packed the same as the second case, only that there are six tiers in the case, containing 30 apples to the tier, the total contents being 180.

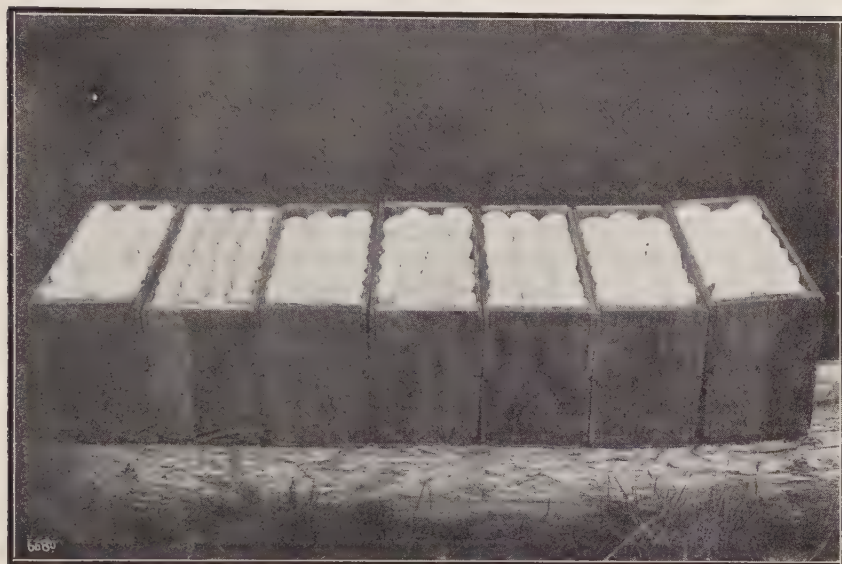


PLATE I.—SHOWING THE CASES OPENED AT THE TOP.



PLATE II.—THE SAME CASES OPENED AT THE SIDE.

The fourth case is of a $2\frac{3}{4}$ in. grade, and is packed the same as the third case, only that the apples are not packed so closely in the tier, thus allowing a slightly larger pocket. The apples will not then come too high for the case, each tier containing 22 apples, making 132 to the case.

It will be noticed that the top view of case 5 is on the square system, the apples fitting three across; but by reference to case 2, on the top row of Plate II, which is the fifth case in Plate I opened on its side, it will be seen that the apples are lying in the pockets. This result is obtained by packing the first tier square in the case, the next tier containing three apples less, the third tier being again full, with the fourth tier three apples less, and the fifth tier again full. This makes a very nicely packed case, but is not to be very highly recommended, owing to the fruit being packed square across the case, and being more liable to bruise.

Case 6 contains apples of the 3 in. grade, and is packed on the two-one system, an apple being placed in each corner, and the third one in between the other two, thus forming the pockets for the succeeding tier. In this instance the apples are packed on the flat, and the case contains six tiers of 16 apples each, the total being 96 apples to the case. By packing these on the edge and giving a little more variation this grade can also be packed five tiers to the case.

The last case is of the $3\frac{1}{4}$ in. grade, and is packed on the two-one system, as in the previous grade, but the apples are placed on their sides, as shown by the photograph. The case contains five tiers of 17 apples to the tier; total, 85 apples to the case. As apples vary in shape, some being longer and some thicker than others, the totals here given will vary in some varieties. Those used for the first three grades were Cox's Orange Pippin, and for the remaining four grades Alfriston.



AN APPLE-PACKING DEMONSTRATION IN A NELSON ORCHARD.

THE HEMP INDUSTRY.

W. H. FERRIS.

THE quality of the hemp coming forward for shipment is being fairly well maintained, especially in regard to strength and colour. The scutching, however, has not been, in many cases, as carefully carried out as it should have been. Complaints have been made, chiefly by foreign manufacturers, as to this weakness in our hemp. There is justification for this, as the tails of some lines are quite towy. This, of course, is more pronounced where the tails of the hanks are not clipped in the field. It is gratifying to know that such good work is being done in some mills—that good-fair fibre is being obtained although the leaf is not sorted prior to stripping. Careful stripping and generally careful work throughout the whole process of milling are responsible for the good results being obtained. The high grade is in this case being obtained at actually a lower cost of production, owing to the labour formerly required for the work of sorting not being necessary.

The quantity of hemp milled during the past month has been fairly well maintained, the Foxton mills having been particularly active. No doubt the high pressure at which some mills are working is due to the owners having entered into contracts which will carry them well on into next month.

Recently it was announced that a considerable improvement had been effected in the marketable quality of the hemp, by reason of the tails of the hanks being clipped off in the bleaching-fields by means of a lawn-trimmer. This necessary work has been further improved by the use of a machine, working automatically, which takes off the tails, immediately after the washing process, as the hemp is suspended from the conveying-chain. This improvement means a further reduction in the cost of production, while a considerable improvement in the marketing quality of the hemp is effected.

Messrs. Suttie and Wynyard have been further experimenting with the object of improving their automatic scutcher and washer. The new idea is to provide a third drum, which will treat the butt of the hank while the other two drums treat the tail. This improvement is much needed. It should make the automatic scutcher a really effective apparatus, making for both improvement and economy in production.

Several mills are closing for the winter. In some cases this is absolutely necessary, owing to the effect of cold weather on the leaf. Several mills, however, will have no off season.

It is satisfactory to know that considerable care is being exercised in the management of the swamps. The drains are being kept clean, and the rubbish is being grubbed up. This means that the flax will have a good opportunity to develop well, and that the leaf available in subsequent seasons will be of good milling-quality.

Stripper-slips are coming forward in very much better condition. One miller is experimenting in the hope that he will be able to improve the condition of this hitherto waste material to such an extent that it may be classed as tow. Generally, more attention is being paid to the slips, which are coming forward in a satisfactory state. Both colour and condition are showing a big improvement on that of the slips first sent in for shipment.

Prices are being maintained at a fairly steady basis, and at the ruling rates are showing millers a decent return. There is a fairly good inquiry for "good-fair." Tow is still in keen demand, in fact, the demand cannot be supplied.

Unquestionably America is the most formidable competitor Australian flour-exporters have to meet in the East; consequently a greater effort is being made to counteract this. Formerly all the Philippine flour trade was done through Hong Kong; but since the enactment of the American tariff law, with the one-bottom rule for shipments to the Philippines, practically all the flour from the United States has gone direct, though much of the financing is done through Hong Kong. During the past season Australian flour of the better grade, states the United States Consul at Hong Kong, has averaged about \$1.12½ gold per barrel higher in price than the ordinary export grades of American flour sold in the Philippines. Australia is steadily increasing her hold on the Philippine flour trade. —*New Zealand Government Agent at Sydney.*

Favoured with good shipping transport, New South Wales and other States are finding good markets for meat in Manila, and the imports of cattle totalled 62,055 head, valued at £310,520, of which Australia supplied 1,661 head valued at £9,032. Mr. Suttor, New South Wales Trade Commissioner in the East, states that the year 1911 has seen great progress in the matter of live-cattle importations to the islands, and an increase of nearly 12,000 head as compared with 1910; the Australian participation showed an increase from 527 head in 1910 to 1,661 in 1911. Hitherto the trade has practically been in the hands of China and the French East Indies, but owing to prevalence of rinderpest and other diseases attention has been given to imports from Australia, solely for killing purposes.—*New Zealand Government Agent at Sydney.*

THE APIARY.

NOTES FOR JULY.

F. A. JACOBSEN.

CONTROL OF BEES.

FROM a nature-lover's standpoint keeping bees is a healthy and remunerative recreation. Dread of the formidable instrument of defence and attack the bee possesses has doubtless deterred many from the pleasure and further study of apiculture, and possibly has not been without its effect on many of those who have taken up beekeeping. An estimate of the risks to be incurred as a set-off against the pleasure and profit that may be expected should be made at the start. To follow in the fashion of our forefathers, adopting the plan of hiving bees in skeps and convenient boxes, would be to forego all later knowledge in the art of beekeeping, which does away with the one-time common practice of destroying these industrious insects over the sulphur-pit. This was done to obtain the comparatively small amount of honey that had been stored during their harvest. The earlier fashion of apiculture, as is the case even at this time, required a considerable amount of courage. Light is, however, being diffused on this subject through all parts of the world. What might be termed recent discoveries have placed the bees under almost perfect control, and the movable frame hives enable the manipulator to investigate the remotest portion of the interior.

I will attempt to describe how the novice may arm himself against attack. The bees will not, until sufficient dexterity and confidence have been acquired, submit so easily to the will of the manipulator, so the learner must defend himself accordingly. Bee-gloves may be used, and these are usually made of stout canvas soaked in oil and allowed to dry. Rubber gloves, such as electricians sometimes wear, are perfectly sting-proof, but should be worn for comfort over cotton or woollen mittens. Rubber is impervious to perspiration, hence if worn without lining in hot weather would be very uncomfortable. A gauntlet stitched on the glove and allowing the sleeve to go inside may be tied round the arm with a string. The hands are now completely protected.

In cool weather bees fall to the ground off the combs, and sometimes crawl up the legs, when, under the slightest provocation and pressure, they sting. To protect against this, tie the bottoms of the trousers round the ankles with a cord. Ladies who commence bee-

keeping, either for profit or pleasure, would do well to wear a divided skirt, and protect the ankles in the above fashion. A veil is next required, and the best and least troublesome is perhaps one made of white or black cotton net. It should be made like a bottomless bag, one end gathered with elastic, to fit tightly over the crown of the hat. The body of the veil should be of sufficient circumference to go easily over the rim of the hat, and sufficiently long to enable the wearer to tuck the ends under the collar of the coat. With a good smoker and so protected it will enable the most nervous to tackle any hive with the utmost confidence. After several lessons those desirous of further studying the economy of the hive will have gained sufficient knowledge to discard all but the veil, and even this during a good flow of nectar may be kept in the pocket. Our safety is just as fully secured by putting the bees on their best behaviour and winning their confidence by gentleness as by arming ourselves fully and accomplishing their submission by clouds of smoke. However, a little of the latter, for which a bee-smoker is used, invariably helps the operator. Whether it is the fear of fire or suffocation, an instinct which probably formed and flourished during the earlier periods when destruction in this fashion by bush-fires, &c., was rife, cannot be said with certainty; but for the present it is enough to know that for all practical purposes a little smoke is of great assistance, and when blown over the tops of the frames the bees hurry below on to the combs, and consume or store in their honey-sacs as much honey as they can conveniently carry. Bees in this condition and so provided with stores rarely sting. Probably the best smoker on the market is the Root, which is made in three sizes, and can be bought made of tin or non-rusting metal. For a few colonies the smaller one is all that is required, but when up to and over fifty colonies are kept, and much honey produced, the largest is the most useful and economical.

Cut a piece of, preferably old, dry sacking about 6 in. wide, and roll this up to fit smoothly into the body of the smoker. Put some live coals into the bottom of your firebox before pushing in the roll, and then commence to blow with the bellows. After a few puffs close the lid and continue blowing, when a thick volume of smoke will issue from the outlet. This will keep alight for several hours if in constant use, and a roll pushed down on top of the old one when a refill is required will relight itself. To quieten bees an equal part of Calvert's No. 5 carbolic acid and glycerine mixed with a little warm water is sometimes used. A cloth is kept damp with this solution, and after the mat has been removed spread the cloth over the frames and leave for a few seconds. The bees are then ready for handling. When using the smoker, should they become vicious after a while, puff some more smoke over the frames until they again become quiet.

WINTER TREATMENT.

The past season has been so unfavourable for the advancement of the bee industry that I would caution all those who have any bees, if it has not already been done, to look through them carefully and determine if they have sufficient stores to carry them through until the spring. Select a fine day for this work, as it may be sometimes necessary to open a hive. An experienced person would go behind every colony and lift up the back, knowing by the weight whether a colony had sufficient stores or not. Those inexperienced in this would have to look inside. This could only be done on a fine day, and then great caution must be exercised in avoiding the breaking-up of the cluster. The colony should be closed again as soon as possible, to conserve the heat. If found deficient in stores a comb or two of honey, or a cake of candy, laid on top of the frames over the cluster would help considerably. At this season of the year bees will not take syrup readily, but if a trial be made be sure and feed thick. Put into the mixture as much sugar as warm water will dissolve. (For feeding see page 207 of the March issue of the *Journal*.) Under no consideration must the feeder be placed in the centre of the cluster. The same may be said of a comb of honey. Bees so divided with a thick wall of honey and comb between them are as two separate lots, and cannot keep up the average heat of the hive without consuming more stores than are necessary. If this were done in a cold climate, death would almost surely result.

WINTER WORK.

If the owner of a large apiary, the apiarist has no time to lose in preparing for next season. Good results will surely be the lot of many then. The main thing now is to get prepared for any emergency: new supers made if required, old ones renovated and repainted, new frames made to replace old ones, accumulations of wax to be rendered down, and many other things done to square up for a new season. It is a good motto in beekeeping to "Never leave until to-morrow what can be done to-day." I have frequently seen tons of honey literally going to waste because some beekeeper had neglected to provide enough supers, or because the foundation he had ordered a week before had not yet come to hand. It is foolishness to leave until too late things that should have been done before. You should estimate now what you require for next season, and send your order at once, and so save delay and disappointment later on. If you are making your own hives and frames see that the timber to be used for bodies is well selected and dry. Put aside boards containing large knots or an excess of gum. The knots may be cut out, and the remainder used for manufacturing frames. The boards containing an excess of gum are practically useless on account of their splitting so easily and of their excessive weight.

ORCHARD WORK FOR JULY.

W. A. BOUCHER.

PLANTING.

IN many localities throughout the Dominion during the month of July the soil remains cold and wet. In spite of this it has been no uncommon thing to see fruit-trees planted out both in orchard and garden. This is a practice to be avoided, for there is nothing to be gained by planting when the soil-conditions are unsuitable. This applies especially to moisture-retentive clay lands, for to tread in wet clay around the roots of young trees is not conducive to the best results. It is better for this reason to defer planting until a later period, when the soil will have become warm and dry. August usually provides this opportunity.

HEELING IN.

No doubt planting when the soil-conditions are unsuitable has been largely induced by the idea that trees should be planted out as soon as possible after they are received from the nursery. Deciduous trees, however, should be heeled in, as it is termed, to await favourable conditions. This is done by digging or ploughing out a trench in well-worked friable soil. When the trench has been prepared the trees should be laid in, either singly or in small bundles, loose earth shovelled over and shaken in among the roots, and pressed down fairly firmly with the foot.

In the case of oversea shipments, where, as sometimes happens, both roots and tops are dry and shrivelling, it may be necessary to thoroughly drench the trees with water, bury completely for a day or two in moist earth or sand, and then remove and heel in in the ordinary way. By this means, if the shrivelling has not gone too far, the bark will recover its normal condition, and trees may be saved that with less careful treatment would be a total loss.

NURSERY STOCK, INSECT PESTS, AND FUNGUS DISEASES.

As a precaution against planting nursery-trees that may be infected by insect pests or fungus diseases it is advisable to prepare for the former a cask of emulsified red oil diluted to the proper strength, and for the latter a cask of the Bordeaux mixture (10-10-40 formula),

and, bundle by bundle, holding the trees root upwards, dip the branches and stems into the mixtures as far as the soil-marks, thus avoiding immersing any portion of the root-system that has been beneath the soil-level in the nursery. The dipping in the red-oil emulsion should be carried out when the trees are just received, and before heeling in; and in the Bordeaux mixture after lifting from the trench and before planting out. Usually this will allow an interval of about one month between the two dippings. Growers adopting this method will find that much time and labour has been saved as against spraying the trees after they have been planted in the orchard.

PRUNING.

In most localities fruit-trees will have shed their leaves, so that pruning-operations may be pushed forward with advantage in anticipation of the necessary spraying for various pests and diseases.

SPRAYING: PEACHES AND NECTARINES.

The most troublesome disease to which this class of fruit is subject is attack by the fungus *Clasterosporium carpophilum* (die-back). Many people are still of opinion that leaf-curl is the most serious trouble to which peaches and nectarines are liable, but in this they are mistaken. The fungus above mentioned causes serious injury not only to the bark on the growth of the season, but also to the buds. In the case of unsprayed trees it is no uncommon thing in the early part of the season to see the buds, just at the time that they should be expanding to produce blossom and leaf, dropping wholesale from the twigs, leaving perhaps only the terminal bud to produce a small cluster of leaves. This is due to the fungus attacking the buds at the base. There are two periods during which the atmospheric conditions favour the germination of the fungus—late autumn and winter, and the months of spring and early summer. It is therefore necessary to protect the trees from attack during the latter part of June and July by spraying with the Bordeaux mixture, 10-10-40 formula, as soon as possible after the leaves have fallen, and repeating the application in August just about the time that the buds commence to swell, as a further preventive against attack during the months of spring and early summer.

So far, no other spraying compound has been found effective in controlling this disease. Other formulæ and methods of preparing the Bordeaux mixture have been tried, such as the Bordeaux made with soda instead of lime; but the results have proved more or less unsatisfactory, largely no doubt because they are less adhesive than the freshly made lime Bordeaux.

MUSSEL SCALE, RED SPIDER, AND WOOLLY APHIS.

It is now generally admitted that spraying with emulsified red oil diluted to the proper strength is a thoroughly effective remedy for the control of mussel scale and red spider, and also that winter spraying materially reduces the ravages of, though it does not eradicate, woolly aphis.

There is no doubt, if the red oil is used systematically for the winter spraying, followed by the hand painting of any spots where colonies of aphis appear later with emulsified red oil undiluted, that trees subject to "blight" will be rendered almost immune from attack. On this account it seems probable that varieties such as Cox's Orange, Sturmer, &c., which growers in some localities have been averse to plant on account of their blighting habits, will once more come into favour.

CHERRY-LEAF SCORCH (*GNOMONIA ERYTHROSTOMA*).

This disease has become very prevalent of late years. Attack by the fungus causes leaf-injury and consequent dropping, often to a serious extent. Such defoliation checks growth, and in some instances even causes the death of the trees. It would be as well if growers were to realize, even if symptoms of this disease have not been noticed, that it is wise to take precautions against attack by spraying, when the buds show signs of swelling, with the Bordeaux mixture, 10-10-40 formula.

VERRUCOSIS, AND BROWN-ROT (*PITHIACYTIS CITROPHORA*).

As soon as the main crop of lemons has been gathered the trees should be sprayed with the Bordeaux mixture, 4-5-50 formula, in order to prevent attack by verrucosis and keep "brown-rot" under control.

STRAWBERRY LEAF-SPOT.

The plants should be well sprayed with the Bordeaux mixture, 4-5-50 formula, to control the leaf-spot, which usually becomes troublesome during the cold weather, and by injuring the leaves retards the growth in spring and early summer.

ROOT-FUNGUS.

In localities where root-fungus is troublesome a soil dressing of 4 lb. to 6 lb. of pulverized sulphate of iron per tree for large trees, 1 lb. to 2 lb. per tree for small trees, and $\frac{1}{4}$ lb. to $\frac{1}{2}$ lb. per bush for gooseberry-bushes, will be found an effective remedy and preventive. The sulphate of iron should be sprinkled over the surface of the soil near the trunk or stem, and lightly worked in.



VIEWS OF THE ARATAKI EXPERIMENTAL FARM : THE VINEYARD.

THE FARM GARDEN.

W. H. TAYLOR.

VEGETABLE-CULTIVATION.

For purposes of gardening spring may be said to commence with July, for with the first days of that month seed-sowing begins.

Peas.—The first thing to attend to is the pea-supply. The usual plan is to simultaneously sow two varieties at least. One kind should be a dwarf, the other a taller sort, as the latter varieties are longer than the dwarfs in coming into bearing. They come into use when the supply from the dwarf is nearly over. If for any reason it is not convenient to sow two kinds at this time, another sowing of a dwarf kind should be sown as soon as the first is showing above the soil. Sow a taller kind at this latter date in any case. The best rule to follow as to time of sowing after the first is to sow again as soon as the last sowing is up. Dwarf kinds may be sown thicker than taller sorts. The rate of sowing should be a pint of seed to a drill 40 ft. long for dwarfs, and the same quantity to a 50 ft. drill for varieties up to 3 ft. It is a mistake to grow the taller sorts unless they can be provided with stakes, for they otherwise smother themselves, and a great part of the crop is thereby lost. Some knowledge of the habit of varieties is necessary to determine how thick the seed should be sown. Some varieties branch out freely, and in these cases the plants should be quite 6 in. apart. Dwarf varieties do not branch, or only to a slight extent, and with them thin sowing only leads to waste. I have tested the matter by sowing so that each plant had a clear space from its neighbour, and found no increase per plant against those sown thickly. Rows so sown meant waste of ground, so small was the produce.

Onions.—What other seeds should be sown largely depends on local conditions. It may be set down as an axiom that it is better to wait awhile rather than sow seed in ground unfit for its growth, whether this may arise from hurried preparation or a too wet state. With this reservation, you cannot get your onion-seed in too early. This may require a little explanation. Firstly, then, if the soil is too wet when the seed is sown it cannot be sown properly, and will be likely to fail to grow. Again, it may come up all right but not make growth for a few weeks thereafter. This is bad. Where experience shows that such a thing is likely to happen it would be better to sow a little later. But this should be always kept in mind: mildew seldom appears before the end of January, usually later, and

it is highly desirable that the crop should be in an advanced state before its appearance; also that late-sown crops meet dry weather before they have attained any size, and the chances are against their ever doing so. The prevalence of mildew in some districts, usually flat country with a moist climate, is the chief reason why many cultivators sow in autumn. This is an aspect of onion-culture that has been treated on at seasonable times in these notes. It is only necessary now to say that transplanting should be done when the ground is fit for the work. Some will say, "Why transplant? I have grown good onions, autumn-sown, without transplanting." I know that; still I say transplant, and you will grow them still better, and with greater certainty, as the tendency to bolt to seed is very materially checked by transplanting.

Carrots that have stood the winter go to seed in spring. As soon as the tops begin to show signs of growing, lift all that are left. If stacked in a dryish place, and covered with soil, they will keep a few weeks longer. To continue the supply put in a small quantity of Early Horn seed. These come on quickly, are usable in a very small state, and fulfill requirements till the later-sown larger kinds are ready.

Turnip-seed should not be put in so early as carrot. In the Wellington Province August is as early as we can sow: they go to seed if sown earlier.

Cabbage and *cauliflower* plants, from the autumn sowing, should be ready to go out. Get them planted as soon as they are large enough; the earlier the better.

Lettuce.—The same thing applies to lettuce. Put out a good bed of these, for this planting frequently affords the best heads of the season. They stand longer than those sown at any other time, and are in greater demand.

Rhubarb may be planted in deep rich ground. That enriched with stable manure is most suitable. It is useless to attempt to grow rhubarb in poor soil, or soil deficient in humus. Any of the ordinary varieties advertised are good, with the reservation that the giant-stalked kind, known as Hogan's Shillelah, is good only for large stalks; it is not otherwise a prolific sort. Myall's Linnæus is the favourite market variety, but the most important point is to secure a good strain. This is only to be got by selection. Plants from seed are exceedingly variable, and only a few are really good, so that this method of securing plants should be regarded merely as affording opportunities for selection.

Jerusalem artichokes still remaining in the ground should now be dug. The tubers will keep fit for use for some time yet if put in a dry place and covered with dry earth or sand. They wither if stacked in a dry place and are not covered. They grow quicker if put in a damp

place. The plan of leaving a certain number of tubers in the ground to produce the next crop automatically is not suitable for garden work, being too uncertain, not to say untidy.

Horseradish is by many considered indispensable, yet it is seldom well grown, and it is only really good when well grown: it pays for a little trouble. There are several ways of growing horseradish, and it matters but little what way is adopted if it is remembered that only the growth above the set is of value, and that the sets should be planted deeply to ensure a good length of usable stick. This is easiest accomplished by making holes with a crowbar 18 in. deep. Drop in a piece of stoutish root 6 in. long, and fill up with extra light soil or ashes. Old beds should be trenched out, stout sticks cut off and heeled for use, and enough of second size taken for planting a new bed.

Vacant ground should be dug over. If left to grow weeds it harbours slugs, which mean future trouble, and the perpetuation of weeds. *Poa annua* particularly, which is absolutely ubiquitous, ripens its seeds all the year round, and is a very troublesome weed when in the seed-rows. Pay particular attention to cleaning beneath hedges. Take away all rubbish from beneath them, for it offers very efficient shelter to slugs and other insects.

FLOWER-CULTURE.

Planting.—July is not usually a good month for planting evergreen shrubs and trees, but this is governed more by conditions of soil and climate than by any hard-and-fast rule.

Roses may be planted, and most things of a deciduous character, also herbaceous plants. Roses planted at this time and during the remainder of the planting season should be pruned before being planted, for it is not easy to prune a newly planted bush without disturbing the roots; in any case the bushes are more conveniently pruned before planting. All established roses should now be pruned. Climbing roses are the most frequently badly managed in this respect. There is a general principle of pruning ruling the work in respect to most varieties, which, however, should be departed from in some instances. The old-fashioned Reve d'Or should not be pruned at all, and Lamarck is also best treated the same way. With these varieties the best way is to let them go for a few years until they are overgrown, or encumbered with dead wood, and then cut them right back to near starting-point. Dorothy Perkins requires thinning rather than all-over pruning. Most other varieties are managed as hereafter stated. In all cases the long and strong rods that are annually produced are to be preserved wherever there is room to lay them in. Old branches should be cut out to give them room, with the proviso that the majority of the main branches should not be considered as old until they have served

two years. Beginning with a young bush, during this month it should be cut back to about two buds for each strong shoot, weak shoots being taken out entirely. From the buds left it may be expected that a certain number of strong rods will spring. These are to be carefully preserved, and tied in full length. When pruning-time comes they are to be left intact, or a few inches of the ends, which are immature, merely removed. Though these to an amateur eye may look unpromising, yet they are the treasure-boxes containing the best flowers. This is even more so regarding stronger rods to be made by older bushes. In spring the best buds on these long rods develop shoots, each terminating in a bunch of flowers. The following year's pruning consists in cutting back all these shoots to about two buds, so that at that time the rods will be furnished with spurs along their whole length instead of as before with buds. The spurs will furnish a shoot for each bud, each shoot producing its cluster of flowers. Now, if this treatment is long continued the shoots gradually lose vigour; consequently the flowers become poor in quality. For that reason it is usually best after a rod has been spurred once to discard it, and lay in a new one in its place. So it will be seen that each rod serves two years after the season that produced it. The period may sometimes be extended where strength is well maintained, or other circumstances, such as lack of new rods, may warrant it. The very old saying that "wood follows the knife," and that weak growers should be pruned hard, is not always correct when applied to roses. To many it will seem like heresy to say it. Nevertheless, and all old ideas to the contrary notwithstanding, I say, if you have a rose that is what we term "miffy"—viz., healthy enough, but with no inclination to grow, keep the knife off. Old ideas die hard. Why? because our minds become so obsessed with them that there is no room for anything radically different. Yet the lesson of experience is that when all probable remedies have failed it is time to try the improbable—something opposite or radically different. I have proved to my satisfaction that the let-alone system is the best cure for "miffy" roses. Hybrid perpetuals require comparatively severe pruning, but this must be regulated according to vigour, and, *inter alia*, I may say that vigour to some extent or in some cases should be regulated by lifting the bushes. In some instances a bush grows very strongly but gives very few flowers. In such cases the remedy is to be found in lifting the plants, pruning back hard, and replanting. When pruning a bush, first cut out dead wood and all weak shoots—cut them right out. Reduce leading shoots according to their strength, or as their position demands, endeavouring to create a symmetrical shape of bush. Extra strong shoots may be shortened by two-thirds, less strong by three-fourths, and side shoots of ordinary strength to two

buds. But such a strong grower as Frau Karl Druschki should not be pruned so hard. I leave all side shoots from 4 in. to 8 in. long, according to strength. I find it to flower well then and give fine flowers, over two hundred blossoms being counted on one bush at one time, all more or less open. Tea roses require no systematic shortening of shoots. Thin out branches if crowded, remove old branches that have become twiggy, and leave young branches in their place. In brief, the thing to aim at is constant renewal of youth in the bushes, by removing old wood, very little else being required except to cut away immature tops of strong shoots, as these are likely to die back.

Chrysanthemums.—As soon as the young shoots appear above ground a sufficient number should be taken for next season's requirements. These should be planted in a nurse-bed. The old plants may then be destroyed. One young sucker is sufficient to provide a plant large enough for all purposes. These should be kept in the nurse-bed till October. Some of the old stools may seem disinclined to throw up suckers, this is often expedited by thrusting a strong fork under the roots, and prising it up, so that the plant is nearly out of the ground. Old plants, or stools, should not be kept, as the flowers they bear are of inferior quality.



A NELSON HOP-GARDEN.

THE POULTRY INDUSTRY.

F. C. BROWN.

WINTER EGGS.

THE reason why the bulk of the birds on some commercial poultry plants are laying at the present season of high prices and thereby returning a handsome profit is that they have been bred at the right time and have been managed to advantage. The fact that eggs have been so dear points to the obvious fact that the bulk of the fowls are not laying. Having been bred at the natural season, they lay when nature dictates and take a rest in the winter. While a variation in output between summer and winter will always be experienced, there is no reason why the selling-price should fluctuate between 10d. and 2s. 6d. The bulk of the poultry stock of the Dominion is on the farms, and it is these which produce the principal supply of eggs; but it is safe to say that the great majority of the costly eggs sold at this season of the year come from poultrymen who specialize in the business, hatching eggs from pedigree of performance hens at the right time, and who feed and manage their birds on the best principles. Farmers in general, at least their wives and daughters, find the keeping of poultry a profitable side-line—that is, if the groceries generally bartered for the eggs are taken into account; but present revenue is nothing to that which would be secured were the farm poultry treated in an up-to-date manner—kept only in such numbers that may be efficiently handled and properly fed and looked after; not left to bustle for themselves and kept till they die of old age.

A farmer remarked to me the other day that there was no money in poultry—at least, his were not profitable. I interrogated him. He had about fifty, of no particular breed; none were under three years of age; they roosted in the trees, and picked up the best part of their living at the back door and around the stable, though they were fed wheat in the evening with fair regularity. The eggs were exchanged for groceries, but no idea could be given as to the value of the eggs laid. Altogether a definite reply could not be given as to what the birds actually cost and what was the exact return from their produce. Under all the circumstances it would be surprising if the bids did pay.

It is generally admitted that few if any birds show a net profit after two laying seasons; while to properly protect them from extremes of weather, especially in winter, to keep them in a thoroughly clean

condition, and to feed and manage them in an intelligent manner, certainly with as much care as that taken with other classes of stock, are essentials which must be observed. Then, to secure eggs in the dear season implies hatching at a special time. The high-type laying bird is not a thing to be treated as though it were a nuisance on the farm—to have dogs “sooled” on it because it is always in the feed-boxes in the stable—but must be looked upon in the same light as other animals on the farm. It is on the farm where eggs should be produced at the cheapest cost. This implies some understanding of the requirements of poultry, however. In the first place, a proper poultry-house should be erected—not necessarily an elaborate structure—I have seen a very good house constructed out of three-by-twos covered with sheets of corrugated iron. Anything is better than allowing the birds to roost on the back of a dray or on the fence. It has been argued that in roosting anywhere the birds are living under natural conditions. No doubt this is very true, but under the circumstances only a natural supply of eggs may be expected. It may with as much reason be contended that the cow should be treated in the same way; but the heavy-milking beast, giving up to, say, 6 gallons of 4-per-cent. milk in a day—an animal much akin to the heavy-egg-producing bird reared on the plants of the Department—would hardly maintain its great artificial yield unless well fed, sheltered from adverse weather, and treated in a kindly manner.

It is time the farmer put his thinking-cap on in regard to poultry. I do not contend that it will pay to take up poultry on the large farm, except may be there is a daughter who takes an interest in them, but there are many small farms where the poultry should furnish a most acceptable addition to the income. In these cases the poultry section of the farm should be studied. If regarded as a side-line to be established and maintained as it should be there is every reason why it should pay handsomely.

The farmer who intends to keep his poultry stock on businesslike methods must straight away do several things. He should first of all provide proper quarters, so arranged that the work of cleaning can be made as easy and as expeditious as possible. A simple open-front lean-to building, 5 ft. high at the back, 7 ft. in the front, and about

CONSTITUTION

No success can be achieved unless a vigorous constitution is maintained throughout the flocks. If contagious disease comes along, the good constituted birds will have greater resistant power and may escape infection where weakly birds will contract it and probably succumb.

16 ft. deep, is all that is required, provided, before all things, that it is draught-proof. Provision should be made for a constant supply of clean water. The houses should be able to accommodate all the birds inside on wet and cold days, while the grain should be fed at night in the litter on the floor of the house. Having proper quarters, heavy culling should be adopted in order to weed out all old and otherwise unprofitable stock. A few good stock birds should be purchased, preferably of a laying strain of one of the general-purpose breeds, and these should be kept distinct from the general flock and be given ample opportunity to exercise and maintain themselves in sound condition. It is a mistake to let these birds get too fat. While it is true that the high-type layer cannot be overfed on a proper egg-producing food, it is possible to make a bird overfat when she is on a diet such as that desirable for breeding-birds, in which there is only a small amount of forcing-ingredient. Another necessary means of maintaining the breeding-bird in good condition is to keep it well supplied with green material. This, combined with exercise, is essential if sound stock is to be secured. It is better to gradually build up the flock from chickens reared on the farm than to buy pullets. As soon as a bird is two years old it should be marketed for what it will bring, or else potted. When the chickens have been hatched they should be marked, as a future guide to age. A punch for the purpose can be obtained for 2s., together with instructions as to its use; few people can accurately judge the age of a fowl. As the majority of birds are unprofitable after their second laying season they should be then culled out without exception. The best time of the season to cull is when the bird is taking a rest previous to moulting.

While White Leghorns are certainly the most popular egg-producers at the present time, there are good reasons why the farmer should use heavier breeds—that is, if he can secure these of an undoubted laying strain. Take the Black Orpington of the egg type. This bird may not lay as many eggs as the White Leghorn in twelve months, but it will most probably lay more eggs in the dear season, and very often, if the average market value of eggs be taken into account, will return the greater value from its year's work. Again, the cockerel of this heavier type—and in the general course of things as many cockerels as pullets are hatched—will be worth more money. Another advantage with such birds as the Orpington is that the hens are good sitters and mothers—a point which should specially appeal to the farmer who will not care to be bothered with artificial incubation. The White Leghorn of the extreme laying type is a poor sitter, and often an unsatisfactory mother, while she probably will not become broody till too late in the season. Another advantage in heavier breeds to the farmer is that they are more easily confined.

FEEDING.

Feeding the moulting bird to advantage is imperative if the second season's laying is to prove profitable. The most common mistake is to stint it because it is not laying. This semi-starvation policy is much to be deprecated; it is not only cruel, but it is unprofitable. Considering the very short rest the modern egg type of fowl takes between her laying periods she demands every care and attention during the moulting-time in order to recoup her strength after the exhausting laying period and to have her in good condition to start away well on her second season's production. On the other hand, it is a mistake to continue the egg-forcing diet. The bird's nature at such a time does not demand stimulating or nitrogenous compounds. It is only necessary to feed meat (or a substitute) separately to test the truth of this. In her moulting-time a bird will seldom look at meat. Everything done should be aimed at maintaining the bird in a healthy, thriving condition. A plain mash should be fed in the morning and grain at night. It is a mistake to include meat in the mash, for meat fed when the bird does not require it has the tendency to set up an unhealthy condition, which certainly does not conduce to a profitable second laying season.

The high price of eggs is inducing many people to unduly force their birds with stimulating foods. This is having the inevitable result of bringing on ovarian troubles, protrusion of the oviduct being a common phase. The only remedy is to place the birds on a plainer diet. With pullets coming on to lay the feeding of a forcing diet should be introduced gradually, and even then the nitrogenous material should be supplied with great caution. Blood-meal is a common cause of the trouble. While this substitute is handy and effective it should never constitute more than 6 per cent. of the entire mixture. The ideal arrangement should be to feed the meat separately, but this of course, is not always practicable. In oviduct troubles the whole of a flock should not have the nitrogenous compound eliminated from the mash because one bird is thereby being overforced; but if trouble is experienced it is advisable to exercise caution and see that the percentage of nitrogenous material in the mash is not excessive.

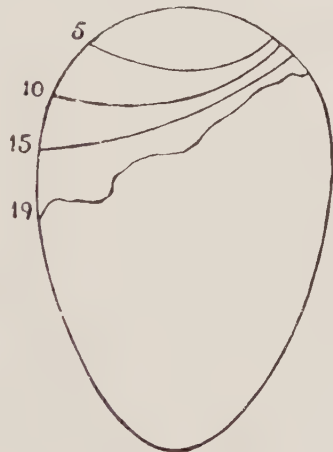
THE SITTING HEN.

Those intending to hatch out large numbers of the heavier breeds should be preparing their incubators or nests now. As the great majority of readers will be rearing their chicks in nature's way, a few words on the management of the sitting hen may prove useful. In the first place, every care must be taken to prevent the appearance of vermin. The pen should be well dusted with an insect-powder previous to being entrusted with the eggs, and again prior to the

hatching. The nest should be isolated, so that the hen may not be disturbed, and preferably should be in the shade. Mother earth is the best of all floors, more especially in dry weather, and the soil should be formed into a saucer-shape to keep the eggs well together. The nest should, however, not be too confined, as the hen must have the necessary room to turn the eggs, which she does several times daily. Hay or pine-needles make good nesting-materials. It is always advisable to try the hen with some dummy eggs before entrusting her with the eggs to be hatched. She will take to the eggs much better if placed on them in the evening and if the nest is kept dark for the first day or two. It is a mistake to put too many eggs under a hen. With ordinary-sized eggs and a medium type of bird twelve to thirteen eggs should be sufficient. If several birds are set at the one time it



No. 1.



No. 2.

will be found economical and convenient, should a good percentage of the eggs prove to be infertile after being tested on the fifth day, to transfer the fertile eggs to make up complete sittings and give new eggs to the bird or birds relieved by the testing-out process. The tester should be used from time to time to make sure of fertility, and then to ascertain the rate of development of the air-cell. If the egg is fertile it will appear as in Fig. 1 — presenting a spidery-like appearance, being slightly red in colour. If infertile it will be quite clear and remain clear throughout the hatching period. Fig. 2 indicates the correct size of the air-cell on the fifth, tenth, fifteenth, and nineteenth days. If the air-cell correctly corresponds with the diagram no artificial moisture is required, except at the pipping stage, when slightly moistening the earth is always a desirable safeguard. If at any stage the air-cell is drying down too fast it is necessary to supply

moisture—not direct application of this, but the creation of a moist atmosphere by damping the soil under the eggs.

INTERNATIONAL ASSOCIATION OF POULTRY INSTRUCTORS AND INVESTIGATORS.

The following official statement in regard to the first conference of the International Association of Poultry Instructors and Investigators, taken from the English *Poultry Journal*, has been forwarded to me by Mr. Edward Brown, F.L.S., hon. secretary of the National Poultry Organization Society of England :—

The growth of the poultry industry in nearly every country of the world during recent years has been phenomenal. From being, with a few exceptions, a by-product of the farm, of small value and regarded with indifference or totally neglected, the various races of poultry have proved a source of profit to agriculturists of all grades, and to many others, who have found an ever-increasing demand for eggs and poultry, the prices of which have advanced very largely. An estimate has been made that the annual value of the world's poultry crop exceeds £250,000,000, and is rapidly advancing.

As a result of these developments, though these are to a greater extent than is commonly supposed due to educational and experimental work, there has been of late years a considerable amount of attention given by various Ministries of Agriculture, colleges, and experiment stations in different countries to the teaching of and experimental work in connection with poultry-keeping. The problems which necessarily follow increase of members and intensification of production are commanding the services of trained instructors and investigators, and the work which is being done is of great value. That this will rapidly advance is unquestionable.

Such developments have been most marked in Canada and the United States of America. Four years ago the poultry instructors and investigators of those countries formed an association for mutual co-operation and interchange of observations and experience. The last meeting was held at Orono, Maine, in August, 1911, at which a resolution was adopted in favour of an association embracing such workers in all the countries of the world, the number of which is already considerable. It was felt that by focussing the knowledge and experience of all the power of each would be greatly enhanced. As a result of this action, a provisional committee has been formed, consisting of representatives of the following countries :—

AUSTRALIA.—Professor H. W. Potts, Principal Hawkesbury Agricultural College, New South Wales ; Mr. F. W. L. Anderson, Brisbane, Queensland ; Mr. D. F. Laurie, Department of Agriculture, Adelaide, South Australia ; Mr. R. J. Terry, Agricultural Department, Hobart, Tasmania.

BELGIUM.—Mons. A. Van Gelder, Uccle, Brussels.

CANADA.—Professor W. R. Graham, Ontario Agricultural College, Guelph.

DENMARK.—Mr. W. A. Kock, Copenhagen.

ENGLAND.—Professor F. V. Theobald, S.E. Agricultural College, Wye ;

Mr. C. E. J. Walkey, Poultry Instructor, Somerset County Council.

GERMANY.—Professor Beeck, Crollwitz, Halle-am-Salle.

HOLLAND.—Mr. H. B. Beaufort, Haarlem.

INDIA.—Mr. A. C. Dobbs, B.A., Agricultural Department, Pusa, Bengal.

NEW ZEALAND.—Mr. F. Brown, Department of Agriculture, Wellington.

NORWAY.—Lieutenant-Colonel Thame, Christiania.

SCOTLAND.—Mr. Wil. Brown, West of Scotland Agricultural College, Kilmarnock.

SOUTH AFRICA.—Professor T. E. Durden, Rhodes University College, Grahamstown, Cape Colony.

UNITED STATES OF AMERICA.—Professor Leon J. Cole, Madison, Wis. ; Professor F. E. Elford (President American Association), Buffalo, N.Y. ; Professor J. E. Rice, Cornell, University, Ithaca, N.Y.

WALES.—Mr. W. Hopkins-Jones, University of North Wales, Bangor.

Others will be added in due course.

By postal vote the members of the provisional committee have elected Mr. Edward Brown, F.L.S., of London, hon. secretary of the National Poultry Organization Society, as the first President of the International Association, and Dr. Raymond Pearl, Chief Biologist, Agricultural Experiment Station, Orono, Maine, U.S.A., is acting as honorary secretary *pro tem*.

Arrangements are being made for holding the first meetings of the provisional committee in London, 18th to 24th July, 1912, at which it is anticipated that a most representative international gathering of poultry teachers and investigators will be assembled. These meetings will be held in the council-room of the Royal Agricultural Society of England, 16 Bedford Square, London W., by courtesy of the Council.

THINGS TO REMEMBER.

There are culls at all ages and in all breeds.

The good layer converts her food into eggs ; the drone into flesh.

Hens will lay as well without the attention of a male as with one.

Don't swallow every new theory that comes to light. Use your own judgment mixed with a little common-sense.

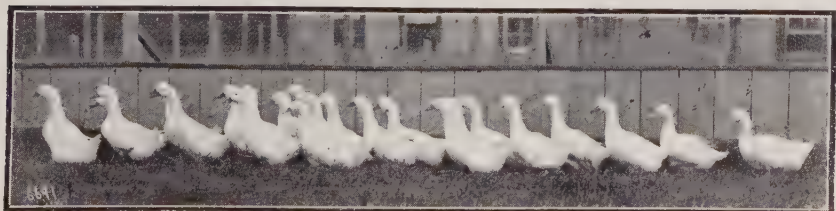
The only way to be sure there are no red mites about is to examine the perches at night.

Winter eggs are the most profitable. If your neighbour gets them, why not you ?

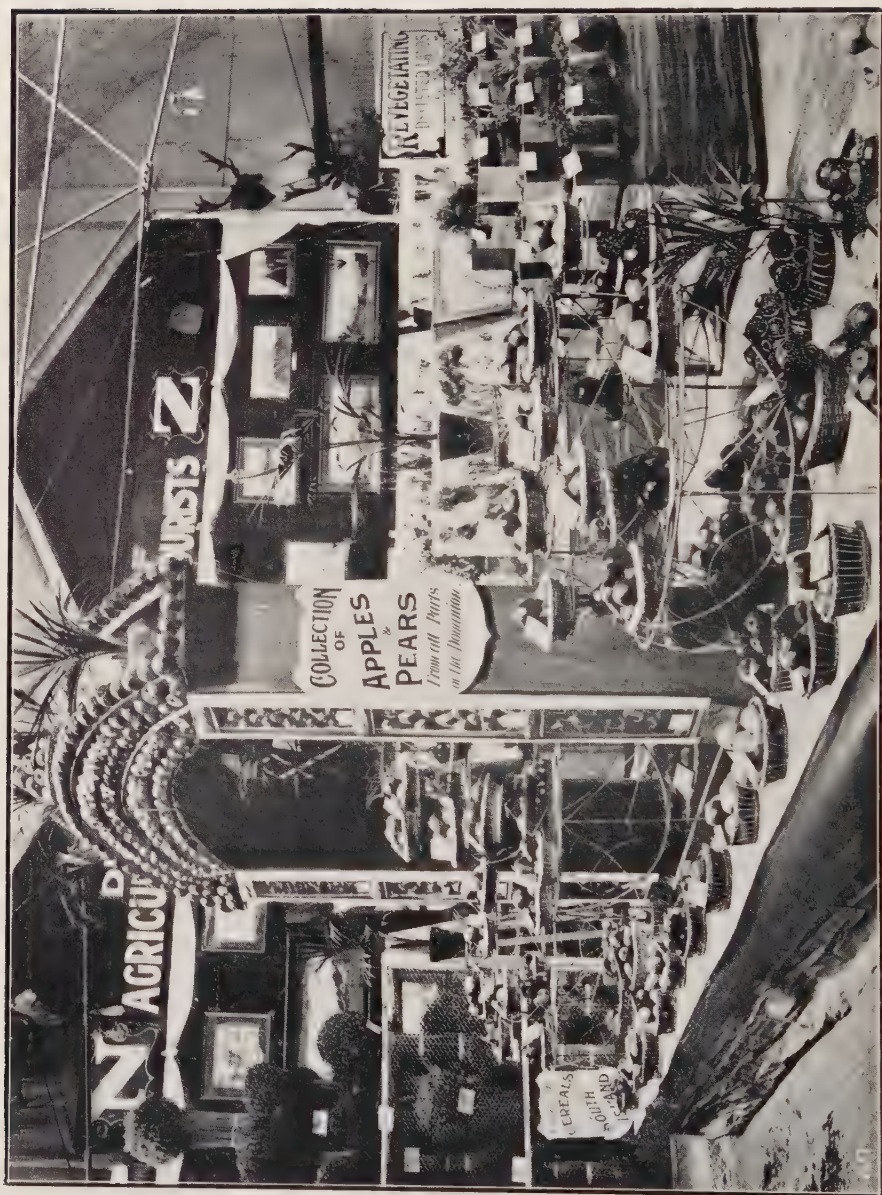
An ounce of prevention is worth several pounds of cure when it comes to poultry-disease.

Green food is good the whole year round. Remember it reduces the grain account.

After the first laying season a hen's value as a layer lessens, and after the second year she may be fruitful but will not be profitable to keep.



DUCKS AT RUAKURA FARM OF INSTRUCTION.



DUNEDIN WINTER SHOW : A PORTION OF THE DEPARTMENT'S DISPLAY.



DUNEDIN WINTER SHOW : ANOTHER VIEW OF THE DEPARTMENT'S DISPLAY.

CO-OPERATIVE EXPERIMENT RECORD.

POTATO VARIETIES.

G. DE S. BAYLIS.

EXPERIMENTER: W. Arundell, Patea. Description of soil: 6 in. to 8 in. loam, upon a light-yellow porous subsoil. Cultivation: Ploughed 7 in. to 8 in. deep, July 15; harrowed, Aug. 9; scuffled, Aug. 10; harrowed and ridged, Sept. 6; harrowed, Sept. 11; sprayed, Oct. 16; Nov. 3, Nov. 13, and Dec. 8; earthed up, Oct. 20; hoed, Dec. 20. Date sown: Sept. 6. Manures per acre: 372 lb. of the following mixture—33 lb. kainit; 36 lb. super., 19 lb. blood, 19 lb. Wanganui bonemeal, $4\frac{1}{2}$ lb. sulphate of ammonia.

Of many varieties planted, there was only sufficient seed to put in some 15 to 20 yards of drill. In others the rows run the whole length—viz., 52 yards. The crops were carefully weighed when the record was taken, and the yields computed at per acre as under:—

Row.	Variety.	Yield per Acre.			Total.
		Seed.	Pigs.	Market.	

PLOT 2.					
		Tons cwt. lb.	Tons cwt. lb.	Tons cwt. lb.	Tons cwt. lb.
1	British Queen	1 15 17	1 4 101	..	3 0 6
1	Ambrose ..	4 16 3	1 8 90	..	6 4 93
2	" ..	3 9 16	2 3 24	..	5 12 40
5	Robin Adair ..	..	0 15 3	5 1 51	5 16 54
5	King Edward ..	..	1 1 67	1 11 23	2 12 90
2	Quick Lunch	..	1 7 32	5 17 30	7 4 62
2	London Seedling	..	0 16 23	3 10 25	4 6 28
3	Million-maker	..	1 9 102	7 3 85	8 13 75
4	Northern Star	..	0 6 33	8 2 5	8 8 38
6	Dalmeny Beauty	..	1 2 48	4 2 29	5 4 77
4	Palmer's Prolific	..	6 9 72	Nil	6 9 72
5	Dalmeny Beauty	..	1 8 90	4 15 7	6 3 97
2	Monarch of France	..	2 3 23	3 12 2	5 15 25
5	Purple Seddon	..	0 10 90	8 2 6	8 12 96
7	Princess Victoria	..	1 8 28	4 19 80	6 7 68
8	"	..	1 5 85	5 8 96	6 14 69
9	"	..	1 9 9	6 12 14	8 1 23
10	"	..	1 5 85	6 7 108	7 13 81
11	"	..	1 16 63	7 10 45	9 6 108
12	"	..	2 10 77	4 9 83	7 0 48

PLOT 7.					
		Tons cwt. lb.	Tons cwt. lb.	Tons cwt. lb.	Tons cwt. lb.
1	Princess Victoria	..	1 7 83	5 18 48	7 6 9
2	"	..	1 8 30	7 16 94	9 5 12
3	"	..	1 13 68	6 5 41	7 18 109
4	"	..	1 14 16	6 4 33	7 8 49
5	"	..	1 14 75	7 15 27	9 9 102
6	Richard Seddon	..	1 0 30	11 16 97	12 17 15
7	"	..	1 2 105	12 11 90	13 14 83
8	"	..	1 4 0	13 4 68	14 8 68
9	"	..	1 0 90	12 7 60	13 8 38

*Notes (Plot 7).—*Areas just under one-sixtieth acre. Manure: Same mixture as on Plot 2. Quantities: Row 1, 420 lb. per acre; row 2, 720 lb. per acre; all others, 360 lb. per acre.

Hereunder are appended the remarks made upon each variety by the experimenter:—

British Queen: Suffered severely from the wind. No blight.
 Ambrose: Very disappointing.
 Robin Adair: Tops suffered severely from the wind. No blight.
 King Edward VII: This potato has never yielded with me.
 Quick Lunch: Tops cut by wind. Early maturing sort.
 London's Seedling: Deep eyes; small size. Nothing to recommend it.
 Million-maker: Nice shape; rather on the small side. No blight.
 Northern Star: Strong grower. Stood wind well. No blight.
 Dalmeny Beauty: Tops badly cut by wind. Nice potato.
 Palmer's Prolific: Very poor indeed.
 Monarch of France: Tops made no growth. Very disappointing.
 Purple Seddon: Potato blue all through; not at all a marketable sort.
 Princess Victoria: Is the best potato I have grown. Early maturer, good cropper, and splendid quality. Rather inclined to blight.
 Richard Seddon: Is the hardiest and heaviest cropper and best blight-resister and keeper; but still is not equal in quality to Princess Victoria, being rather too close, to my fancy.

SURFACE-SOWING OF GUM SWAMPS.

ON A GUM SWAMP AT KUMEU, THE PROPERTY OF MR. P. BOUCHER.

G. DE S. BAYLIS.

THIS experiment was undertaken with a view to seeing if by some such means partially drained swamps in gum country could be brought into some degree of profit until such time as the farmer was able to fill in the holes, stump, plough, and sow down to grass in the usual manner.

On these swamps the gum has been found in great abundance. They are simply honeycombed with holes and pits of more or less depth, breadth, and circumference. The owner calculates that the filling-in of the holes, clearing away timber, ploughing and cultivating would cost him over £5 per acre on this particular class of country, without including the cost of seed and the necessary manure. If by burning off the scrub and by expending about £1 per acre in seed and manure a fair amount of grazing could be obtained it was thought that not only would the fertility of the land be increased thereby, but that the passage of stock would render the country far more negotiable for horses and implements when the time arrived for ploughing it up and laying it down in grass in the usual manner.

The land was roughly burnt, and, unfortunately, did not make so good a clearing as had been expected. The seed was not sown till the 20th May, 1911, rather later in the year than advisable.

The plots were examined in March, 1912. In the potholes and depressions the grasses had taken fairly well. On the harder and higher land, save where the soil was loose from having been thrown out of the holes, the grasses had not struck so well.

The growth made during this first season, as might have been expected, was rather slow on this unploughed country, but the bulk of the grasses used in the mixture would not, except under very favourable conditions, make very much headway during the first year. The plots which appeared to have done best in the A series were Nos. 2 and 4. Mr. Boucher reported that No. 3 did not do well at first, but had recently much improved.

The following grasses were most conspicuous at the time of my visit: Florin, danthonia, cocksfoot, Chewing's fescue, and *Microstena stipoides*. All the clovers sown in the mixture were represented. There was a very marked difference in the appearance of the plots sown with seed and manure and the one sown with seed only. A feature worthy of notice was the healthy appearance of alsyke, and its comparative abundance, considering the small amount included in the mixture.

At the time of my visit the grasses had been well eaten down, owing to the fact that the plots were unfenced, and formed part of a large area of country upon which a few head of stock were running.

Plot 1 was treated with the same manure as No. 2, but was sown with mixture B, a very varied mixture of odds-and-ends of which Mr. Boucher was unable to tell me the exact composition, or the number of pounds sown per acre. It had, however, a very fair covering, and the verdict pronounced thereon was that its chief fault was that it lacked the alsyke clover so noticeable in the other mixture.

These plots will be watched with interest, as, if they continue to improve (and I am inclined to think they will do so) the possibility of creating rough grazing-land out of similar country by the use of a match, a little seed, and some manure, will be an established fact; and thereby not only will the land return some profit until it can be properly ploughed and sown down, but when ploughed it will be found in a far more fertile state than had it been left in a state of nature.

Plot X.—Seed mixture B: No manure.

Plot 1.—Seed mixture B: 180 lb. slag, 12 lb. sulphate of potash, per acre. Cost of manure only, 8s. 9d. per acre.

Plot 2.—Seed mixture A: 180 lb. slag, 12 lb. sulphate of potash, per acre. Approximate cost of seed and manure, 18s. 1d. per acre.

Plot 3.—Seed mixture A: 269 lb. limestone, 112 lb. superphosphate, 6½ lb. sulphate of potash, per acre. Cost of seed and manure, 17s. 5d. per acre.

Plot 4.—Seed mixture A: 180 lb. limestone, 112 lb. slag, 28 lb. bonemeal, 6½ lb. sulphate of potash, per acre. Cost of seed and manure, 18s. per acre.

The various mixtures of manure applied cost, on a rough average, about 8s. 10d. per acre.

The seed mixture A cost approximately 9s. 4d. per acre, and consisted of 10 oz. *Danthonia pilosa*, 6 oz. *Danthonia semiannularis*, 3 oz. rattail, 3 oz. *Eragrostis Brownii*, 12 oz. Chewing's fescue, 6 oz. meadow fescue, 6 oz. *Lotus major*, 6 oz. *Lotus hispidus*, 6 oz. *Microtena stipoides*, 24 oz. cocksfoot, 3 oz. alsyke, 12 oz. florin; total, 97 oz. or 6 lb. 1 oz. per acre of the mixture.

TRIALS ON GUM LANDS.

MAINLY CLOVERS AND GRASSES.

CARRIED OUT BY MR. P. BOUCHER, KUMEU, AUCKLAND DISTRICT.

G. DE S. BAYLIS.

THESE trials were carried out on gum land consisting of a light, dry, brown loam top soil upon a fine-grained cohesive white silt. The land was broken out of tea-tree, fallowed for about six months, ploughed twice, well disced and harrowed, and finally rolled. Ground limestone at the rate of 1 ton per acre was broadcasted, and later on 400 lb. per acre of the following mixture was applied: 300 lb. slag, 150 lb. Christmas Island guano, 300 lb. Wanganui bonemeal, 75 lb. nitrate of potash, 150 lb. blood.

Lotus hispidus (Boyd's Clover): Grew well. Presents a healthy appearance. Apparently very suitable to poor land.

Lotus angustissimus: Hardy. Obviously very suitable to poor land. These varieties will form nodules on the roots on soils which are too poor and sour to grow any other varieties of clovers. As nitrogen-gatherers, or for ploughing in, they are therefore most valuable. They also form good feed on such classes of country. *Angustissimus* is of somewhat taller growth than *hispidus*.

Lotus corniculatus (Small Birdsfoot Trefoil): Made very slow growth for the first fourteen months after sowing. Has done better lately.

Medicago lupulina (Yellow Trefoil): Healthy, but did not make much growth.

Trifolium perenne (Cow-grass): Has done well, and is especially useful on light land on which shallow-rooting grasses are apt to die out during dry weather.

Trifolium repens (White Clover): Has done well, made good growth, and is a very useful variety for this soil.

Trifolium hybridum (Alsike Clover): Good. Estimated would cut $1\frac{1}{4}$ tons hay on 15th January, 1912. "Next to cow-grass I believe alsike is the most suitable clover for this light land with its heavy sandy clay subsoil," says Mr. Boucher.

Trifolium subterraneum (Subterranean Clover): Very hardy. Grows and spreads very quickly. Grows close to ground. Reseeds itself in autumn, and remains when once sown.

Trifolium fragiferum (Strawberry Clover): Slow to grow here, although healthy. After fourteen months is still not good enough to cut. A low creeping growth. Appears likely to be permanent.

Lespedeza striata (Japan Clover): Was practically a failure. All these plots, however, were sown in November, 1911, and suffered much from drought in the first season.

Medicago sativa (Lucerne): Made very little growth. Condition of subsoil is evidently not suitable. It is possible, however, that on properly prepared ground good results might be obtained.

Melilotus officinalis: Only one or two plants germinated.

Vicia sativa (Tares): The summer was hot and dry, and the tares did not make much growth. Fed off in May.

Small trials of *Soja Beans* and *cow-peas* were made. From the former a few beans were harvested, but the latter proved a failure.

GRASSES.

The grass plots were mostly one-sixteenth of an acre. 300 lb. of the same manure mixture was used per acre, and later on these were dressed with slag at the rate of 2 cwt. per acre. All these plots were sown last season in November, and this spring were cut for hay.

Festuca saburicola (Chewing's Fescue): Does not throw much feed, but takes well, and appears likely to be permanent.

Danthonia semiannularis: Has formed a good sward. It afforded one cutting, composed largely of seed-heads; approximately $\frac{3}{4}$ ton of hay per acre.

Agrostis stolonifera (Fiorin): Has taken well, but does not appear to throw very much feed. The surface soil is probably of too dry a nature in the present condition of the land.

Phleum pratense (Timothy): A fair cut of hay was obtained. It affords good grazing, and has a healthy appearance at present.

Paspalum dilatatum (Golden-crown Grass): Has done well. Cut twice. First cut about $\frac{1}{2}$ ton per acre; second cut about $1\frac{1}{2}$ tons per acre. Is healthy, easily grown, and does well here.

Festuca pratensis (Meadow Fescue): Has taken well, and two fair cuttings of hay were obtained. Some rust and ergot were present, but up to now appears one of the best grasses in the trial on this dry swamp country. Has now a healthy appearance.

Alopecurus pratensis (Foxtail): Two small cuttings. About $\frac{1}{2}$ ton each per acre of hay secured. Is healthy, but at present is somewhat slow of growth. Appears likely to be permanent here.

Bromus unioloides (Prairie): A fair cut obtained. Was afterwards grazed, and has now completely disappeared.

Phalaris bulbosa (Perennial Canary-grass): Irregular and patchy. Its suitability for this soil in its present condition is doubtful.

Onobrychis sativa (Sainfoin): Germinated, but disappeared, probably owing to seed not being properly covered. In the mixed pasture adjacent it is still in evidence.

Poterium sanguisorba (Burnet): Has rooted well. Looks healthy, and seems likely to establish itself.

Lotus major (Greater Birdsfoot): Has done well. Was cut for hay.

Bromus inermis (Awnless Brome): Rather a poor take. Appears, however, likely to establish itself.

Avena elatior (Tall Oat): Made vigorous growth. Was cut for hay. Is again growing and looking healthy.

Sporobolus elongatus (Rat-tail): At present does not seem to have taken, but as this grass is slow at first, judgment thereon must be suspended. Should think it better suited to drier and somewhat warmer soils.

Dactylis glomerata (Cocksfoot): Although, like the other plots, sown in spring, it appears healthy and to be likely to establish itself permanently here. Appears at present to be about equal to meadow-fescue plot in growth.

PASTURES AND CROPS.

MAY.

OFFICERS of the Fields and Experimental Farms Division of the Department report as follows on the condition of the pastures and crops during the past month:—

BAY OF ISLANDS.—The weather in the early part of the month was about the coldest on record, although very little rain fell. The pastures on the warmer volcanic and alluvial soils are still growing splendidly, and on account of the little growth in spring the grass is of fair substance. Very little rain has fallen during the month, the amount being 2.51 in. up to the 30th, the heaviest fall being on the 27th, when 1.08 in. fell. The weather is again broken while writing, and the mild winter of the north has commenced in earnest.—*W. J. Dunlop.*

WHANGAREI.—During the past month cold frosty weather was experienced in the middle of the month and warm rains at the end of the month, which gave the grass a good start. Feed is looking well.—*A. P. Speedy.*

AUCKLAND.—At the commencement of the month cold weather was experienced, heavy rain falling at intervals followed by thunder and lightning. It constantly rained up to the 4th, when indications for better weather set in. The weather then moderated everywhere, and fine warm weather prevailed until the 26th, when a heavy shock of earthquake was felt at 6.5 p.m., followed by rain, the heaviest downfall being on the 29th, which made everything very sloppy, especially the roads in the backblocks. The pastures, particularly on the high country, have benefited by the rains; and there is now no fear of there not being an abundance of feed for stock to carry them through the winter and spring. Root crops are much better than last year, and with other provisions made for the growing of green crops, together with an ample supply of meadow hay, the dairy-farmers have nothing to fear, and can keep up the supply for the factories.—*R. Rowan.*

HAMILTON.—Fine weather prevailed during the early part of the month, and later there were heavy rains with mild temperature. Pastures are looking well throughout the district, and a good deal of hay has been saved. Turnips look well, and there should be a sufficiency of feed for the winter.—*J. Kerr.*

TE KUITI.—During the first part of May the frosts retarded the growth of pastures. They had a hardening effect on green feed and turnip-tops, giving both a healthy appearance. The latter portion of the month has been very wet, cold winds accompanying the rain.—*B. Bayly.*

GISBORNE.—There has not been much rain during the past month, with the result that the roads have been in splendid order, giving backblock settlers a good chance to get in their winter stores. There will be sufficient winter pasture for sheep, but it will be rather short for cattle. The autumn has been dry and warm. During the last week we have had two light frosts.—*Wm. Ross.*

WAIROA.—The past season culminating in an unprecedented autumn has brought about conditions unknown previously in this district. All pastures are in exceptional condition. Crops have been of that standard that the oldest residents have never before seen such profusion. This, you will understand, is without any unusual tillage or effort on the part of the farmers, and only amplifies what can be produced in the district, which is one of the best in the Dominion, if only the settler could be induced to conserve the qualities of the soil. Stock of all classes continue to look at their best.—*T. F. Mullaly.*

OHAKUNE.—The month opened wet, and continued so until the 3rd, after which, more favourable conditions prevailed. From the 19th to the 25th severe frosts occurred but from this on to the end of the month exceptionally mild weather was experienced. The rainfall recorded to date (30th) was 2.23 in. In parts of the district the effect of the frosts is noticeable; but, taken on the whole, pastures still continue fairly good.

Root crops promise to reach a higher standard of maturity than is usual for the district. The milk-supply has considerably diminished within the month, and the supply for town distribution is far from being equal to the demand. Oats in some instances, owing to bad stacking and being stacked on the damp side, have been badly damaged. Those cultivating this cereal should note that it is not advisable to neglect thatching and depend on the stack keeping out wet, particularly so in this district where the weather-conditions are so uncertain and the rainfall so heavy.—*P. Barry.*

MANGAWKA.—The weather during the early part of last month was very wet and wintry. Some severe frosts took place about the middle of the month; this has completely stopped the growth of grass. Towards the end it again changed, and became very mild. At the time of writing it is wet and dirty; the barometer is also very low. There is more grass to be seen now than there was last year at this time. With such a good beginning farmers are confident and hopeful that stock can be carried through successfully.—*J. Melrose.*

NEW PLYMOUTH.—The weather during the first four days of the month continued to be wet, but bright sunny days followed, which lasted to the 15th. On that night very heavy rain fell accompanied by thunder and vivid lightning. Unsettled weather followed for a few days, then three sharp frosts with hot sunny days. On the 27th rain again set in, and has continued to the end of the month, some of the showers being very heavy. Feed is plentiful for this time of the year, and stock are looking well.—*R. E. Fairfax-Cholmeley.*

STRATFORD.—During the past month the weather was wet and broken, accompanied by severe frosts, which had the effect of stopping the growth of grass and considerably reducing the milk-supply, most of the factories only running every other day. Towards the end of the month it was fairly warm and humid.—*Austin F. Wilson.*

HAWEA.—The cold wintry weather of April continued into the first week of the present month, after which much more favourable conditions prevailed. Though the weather continued unsettled, with variable winds and light misty rains, the atmosphere has been quite warm and mild. Pastures continue to make fair growth. The milk-supply is keeping up well, and all main factories are still running daily.—*A. J. Glasson.*

WANGANUI.—During the month of May fairly good weather was experienced, the latter half of the month being somewhat humid and showery, especially towards the end. Although there were several hard frosts, the temperature being mild, it was favourable to the growth of pastures and other vegetation.—*C. Watson.*

FEILDING.—The weather has been excellent during the month, there having been twenty-four fine days, with sharp frosts on the 24th and 28th, which should do a considerable amount of good to the land that is being turned up, and also serve to check the pests in orchards and gardens. Threshing has been in full swing, and heavy yields are recorded, but it is rather early to strike an average estimate. Potato-digging has been going on at a rapid rate, and in many instances realized above expectation (viz., 16 to 17 tons per acre), and seem fairly free from disease. The crops of wheat at Parawanui average 58 bushels per acre, one paddock in particular averaging 64 bushels after having been cropped for twenty seasons out of thirty-three. The name of the wheat is Federation. It can be seen that stock have more provision made for them in the way of hay and ensilage than has been seen during the past three seasons.—*William Dibble.*

PALMERSTON NORTH.—The weather was fine during the greater part of the month of May, although several sharp frosts were experienced. Rain fell on ten days, with a total of 2.45 in. Pastures are looking well. The open weather has allowed farm-work to be well forward and provision to be made for spring feed.—*W. Dalgliesh.*

HASTINGS.—Heavy frosts were general this month, with warm, sunny days. Very little rain has fallen on the low land, but the high hills have been covered with snow. The frosts have had a detrimental effect on pastures, which are not in abundance anywhere; but the weather being dry the stock are doing well. More rain is required.—*J. G. Parker.*

WAIPIKURAU.—The past month has been very cold, some very hard frosts being experienced, and bitterly cold winds, which has had the effect of practically stopping growth; but the last week has been quite mild, and should it continue grass will make a little growth yet.—*H. O. M. Christie.*

PAHIATUA.—The past month, with the exception of several frosts, has been more like spring than winter, and most suitable for farming operations. Total rainfall, 2.65 in.; rain fell on twelve days, the maximum fall being on the 17th instant, 0.73 in. Where overstocked and on light soils feed is becoming scarce, but on the heavy and limestone soils, or where understocked, there is a fair amount of grass at present.—*Thos. Bacon.*

MASTERTON.—The weather during May was cold and showery, with frosty nights. Grass is fairly plentiful, but most of it is rather soft and watery, which means that there will be a big mortality among poor-conditioned hoggets. Potato crops have not done well owing to the early frosts experienced, and the diamond-backed moth is reported to have made its appearance in some of the turnip crops in the district. The little "wax-eye," or as it is commonly known, the "blight-bird," is reported to be doing good work in the orchards and gardens this year, and is frequently to be seen feeding off the "woolly aphis."—*T. C. Webb.*

SOUTH WAIRARAPA.—Seasonable weather has prevailed during the month, much rain having fallen; and on the 25th, 26th, and 27th very severe frosts were experienced. The grass-grub has done considerable damage in parts of the district.—*S. C. Ivens.*

WELLINGTON.—The weather during last month was somewhat changeable, but generally mild and warm, being favourable to agricultural and pastoral operations. A couple of frosts were experienced, but not severe enough to check the growth. Though the milk-yield has fallen, run cattle and sheep are doing well.—*G. H. Jenkinson.*

BLENHEIM.—During the early part of the month there were frosts at night followed by bright sunny days; but during the past week a good deal of rain has fallen all over the district, and as this has not been followed by cold and frosts it has caused quite a strong growth of grass. In the Havelock and Pelorus districts the country looks particularly well for this season of the year.—*F. H. Brittain.*

KAIKOURA.—The weather during May has been fairly good, there being only two or three stormy days with rain, and a fair amount of snow on the Kaikoura Ranges. There have also been several sharp frosts. Farmers are taking full advantage of the fine weather, and are busy ploughing and preparing their land for next season's crops. The growth in the grass has slackened off considerably.—*Wm. S. Goodall.*

HOKITIKA.—The present month has been cold and changeable, and there is a heavy coating of snow on the high country. The rainfall registered to date (28th) is 3.45 in., the maximum being on the 20th, when 0.63 in. fell. Rabbit work commenced in the Murchison district on the 16th, and the weather being cold and frosty whilst operations were in progress most favourable results were reported. I do not consider that the pest is increasing, and settlers seem to be doing their utmost to meet the requirements of the Act, but are also studying their own interests. On account of heavy frosts lately feed for stock will become scarce; and now is the time when farmers would greatly benefit by having a good stack of ensilage to help their stock through the severe winter months.—*J. H. Walton.*

LINCOLN.—During May the weather remained unsettled, there being many dull and cold days, yet without rain. Rain fell on nine days. Frosts were few. There is still a fair amount of feed in most pastures. In certain localities the grub has again done serious damage.—*J. G. Scott.*

RANGIORA.—The weather has been fairly fine during the month, and favourable for ploughing, nearly all of which has been finished in this district. There have been two or three hard frosts this month; also a heavy fall of snow on the high country. The mangels have turned out fairly satisfactory, but not as good as last year. This was owing to the wet season. Potatoes have not harvested as well as in previous years, owing to the same cause. There is every appearance of plenty of winter feed.—*A. Hughes.*

ASHBURTON.—Rain fell on five days—a total of 45 points as compared with 1.51 in May, 1911. For the first time for about six years the diamond-moth caterpillar has not affected the turnip crop, and so far very little grass-grub. A good deal of snow fell in the back country, and snow-raking had to be resorted to, but sheep are now safely mustered on to winter country.—*C. Branigan.*

KUROW.—We have had fairly mild weather considering it is the first month of winter, and just enough snow has fallen on the high country to drive the sheep on to the warm faces and low-lying ridges. Latterly cold westerly winds set in with keen frosts at night, which has stopped the growth of grass on the high country. Farmers are well forward with their autumn sowing, and some of the earlier-sown crops of Cape barley and rye for sheep-feed are looking remarkably well. Settlers in the Duntroon district have been very busy lately carting their grain to the railway, and a special train had to be brought into requisition last week to cope with the increased traffic. There is still a scarcity of farm labourers in this district, and all the threshing-mills have been working short-handed throughout the harvest.—*G. Reid.*

FAIRLIE.—Very hard frosts were experienced during the first half of the month, 20° being registered at Fairlie on several nights. Milder weather is now being experienced. 2 in. of snow fell on the 22nd, but this has all disappeared from the low country,

although there is still a covering on the ranges. Old shepherds say that these early falls do a lot of good by driving sheep out of the dark facings on to the sunny and soft country.—*W. B. Manning.*

TIMARU.—Weather was fair during the early part of the month, but since then there was a fall of snow on the ranges, and hard frosts followed. Farmers are sowing winter wheat, and threshing is still general. The weather is seasonable, and feed is standing well. The potato crop is not digging up to expectations, and mangels are in many cases running to seed.—*J. C. Huddleston.*

WAIMATE.—Several snowstorms accompanied by frosts have been experienced during the month of May, the frosts being particularly severe for this time of the year. Ploughing has to some extent been hindered by the lateness of the harvest, combined with weather-conditions, although a considerable area of grain has been drilled in. It is to be expected from the bountiful harvest and good prices ruling for grain that the area being put in cereals will be considerably above the average. Mangels and turnips are, generally speaking, good. Potato-yields are turning out fairly well, and probably the potato known as the "Gamekeeper" is giving most satisfaction. Pastures are holding out well, and grass is plentiful where not too heavily stocked. Several good crops of linseed, which is not generally grown in this district, have been secured.—*F. A. Macdonald.*

PALMERSTON SOUTH.—The weather-conditions during the month have been good, although at times wintry and rapid in its changes. Threshing is not yet finished, but is being pushed on as fast as possible. Farmers have had an excellent season. There have been good yields, and samples and prices received have been good. High prices rule for stock. The turnip crop is not up to the usual standard, but there will be no scarcity of winter feed. Ploughing and the sowing of wheat is the main work on the farm at present.—*C. S. Dalgliesh.*

DUNEDIN.—Except an occasional day the weather during May has been exceptionally fine—sunny days with a fair amount of frost at night. On Otago Peninsula early-sown swede turnips are very fair, other varieties being only medium. None of the mangel crops have done any good anywhere in this district, not being up to half the usual yield. Buda kale sown in February at Anderson's Bay, Otago Peninsula, is doing very well, and promises good green feed for July and August.—*J. R. Renton.*

MOSGIEL.—During the month the weather has been all that could be desired for winter—slight frosts with fine sunshiny days. Threshing is about finished in the Taieri district, and straw-pressing and chaff-cutting are in progress throughout the district. There are some paddocks of oats in stook in Bruce district, about Table Hill and Akatore, and several stacks have heated because the grain was too damp when stacked. Pastures are looking well and healthy for this time of the season, and there is abundance of rough feed for stock.—*H. McLeod.*

TAIERI.—The month of May came in very stormy, with a fair fall of snow on the surrounding hills; but since the weather has been fairly dry, with some very severe frosts. There are a few oat crops still in stook in Clark's district, but threshing is practically over on the Strath. Oats and barley have yielded well; but wheat has been very disappointing, the bulk of a poor sample being affected with frost. Potatoes and mangels are poor, but turnips are good. The outlook for winter feed is excellent.—*W. Scott.*

LAWRENCE.—The weather has been more or less broken this month, with snow low down on the hills, and a few severe frosts at night. A considerable area of wheat and oats are still in stook, while in a few cases it is not yet cut. The grain crops are very much discoloured, and some of it has not been stacked in good order. The turnip crop on the whole is light. Stock are looking well, and are doing better on account of less rain.—*R. Barron.*

OWAKA.—The weather for this month has been very changeable, one day good, and the rest of the week very cold and wet. Very severe frosts have been experienced during the latter part of the month, and also a good fall of snow very low down on the hills. It is a very trying time for farmers who have their crops out yet; there is a fair quantity in stook and uncut. Late turnips are looking well.—*Thos. D. Urquhart.*

NASEBY.—The weather during the past month has been very poor, a few nights' frost being followed by snow and sleet. In the Paerau district some of the crops have been standing in stook for six weeks, but cold weather has checked any growth, and if given a few good days they will yet get it in fair order. There are some splendid crops of turnips in the Paerau district; and stock is in good condition. There is plenty of rough pasture feed to carry stock through the winter.—*A. T. N. Simpson.*

PEMBROKE.—The weather-conditions during the month of May have been much the same as in the preceding month, only the frosts have been more severe. The general opinion is that the winter has set in a fortnight earlier than usual. Farming operations in most cases are well advanced. The young grass has been cut down by the severe frosts. Farmers have already commenced feeding off their turnips.—*J. A. Griffiths.*

OTAUTAU.—The weather has been very wet and cold throughout the month; some of the oldest settlers state that it is the wettest month experienced for many years. In many cases harvest is not gathered, and by all appearances will not be much good when it is secured. Again, stacks have been pulled down and rebuilt owing to heating. Threshing is in full swing, and corn is being carted to the railway. Some fair yields of oats have been reported, many reaching as high as from 80 to 100 bushels. Wheat is threshing poorly, from 25 to 30 bushels, as most of it was frosted badly. The constant wet weather is greatly retarding ploughing operations.—*H. F. Dencker.*

CLYDE.—There have been some exceptionally heavy frosts within the past ten days, and growth of grass and crops has been brought to a standstill. Turnip crops are not too good this year; and potato crops are light, but the quality is good. Grain crops turned out well, and therefore there is plenty of feed for the winter.—*T. N. Baxter.*

QUEENSTOWN.—We have had more settled weather during May than previously, the rainfall (102 points) being the lowest for any month of this year. Hard frosts with bright sunshine throughout the day for upwards of a week at a time, then a break, rain, and snow on the high country, and frost setting in again, has been the order throughout the month. Agricultural work generally has been going ahead, a number of the farmers having adopted the system of fallowing, principally with regard to barley, this being the crop which escaped the early frost this season in this district on account of it harvesting early.—*A. Clarke.*

LUMSDEN.—The early part of May was decidedly cold, wet, and wintry, making farmers almost despair of ever finishing harvesting operations. However, the middle of the month saw a change for the better, and harvesting was resumed with vigour. During the last few days severe frosts have been experienced at night, followed by bright sunny days. Oats are threshing out well, and potatoes have still to be lifted in most instances.—*W. S. S. Cantrell.*

GORE.—During the earlier part of the month the weather was decidedly wintry—wet and cold, with snow on the higher levels. Since the second week, however, it has been better, although not altogether favourable. There is still a lot of grain in stook. This is badly discoloured, and is in some cases growing. There are also a few crops uncut. Turnips promise a very fair crop, but potatoes are being dug, and are giving poor returns. During the month rain fell on twenty-one days, the heaviest fall being 0.65 in. on the 20th; total fall for month, 3.02 in.—*B. Grant.*

INVERCARGILL.—During the month the weather has been seasonable although cold, and the rainfall has not been high. Some farmers only finished harvesting this month, and there are still to be seen in some parts of the district a few paddocks of oats in stook. Threshing is now going on. Oats are yielding well, but a good lot of the grain must be considerably discoloured, and the chances are that a great deal of this season's chaff will be of inferior quality. Wheat is reported to be badly frosted. Autumn-sown oats and wheat have braided well. Potato-digging is now fairly general, but the work has been kept back owing to the wet state of the ground. The returns from this crop will be considerably below the average. Owing to a few fairly sharp frosts the grass has slackened off considerably, but there is still a good amount of rough feed about. On most farms ploughing is going on steadily, and a good deal of the land is being turned up to the winter frosts. The rainfall for the month was 3.60 in., rain falling on fifteen days.—*J. R. Whyborn.*

The second official estimate of the Argentine wheat, linseed, and oat crops has been published. The figures are as follows: Wheat, 4,610,000 tons; linseed, 595,000 tons; and oats, 877,300 tons, being an increase of 639,000 tons of wheat, and 192,000 tons of oats over the production of the previous year. The estimated yield of linseed is the same as that of 1910-11. Maize statistics are being prepared. It is anticipated this crop will be a record one.—*N.Z. Correspondent, Buenos Aires, 19th March, 1912.*

THE FRUIT CROP.

OFFICERS of the Orchards, Gardens, and Apiaries Division report as follow on the condition of the fruit crops for May :—

WHANGAREI.—There is not much to report in addition to last month's statement in regard to deciduous fruits. Oranges are looking well, and there is good promise of a very fair crop.—*J. W. Collard.*

AUCKLAND NORTH.—Weather good throughout month. Apples still plentiful, and prices improving. Pears in good supply at fair prices. Lemons fair supply at good prices. Peach and plum crop finished.—*W. C. Thompson.*

AUCKLAND SOUTH.—Weather-conditions improved this month. All fruit has now been gathered, a heavy crop of apples having been picked. Little improvement in price with exception of pears, which have risen considerably in value. One thousand cases of apples were shipped from this district to the Argentine.—*N. R. Pierce.*

HAMILTON.—Weather boisterous at beginning of month, but settled down to fine towards end of month. Fruit all harvested, and cultivation of orchards proceeding apace.—*T. E. Rodda.*

WANGANUI.—Fruit season has just about closed, and late crops are mostly in store. Potatoes have yielded very fair crops, with some blight. Winter vegetables doing well.—*W. C. Hyde.*

POVERTY BAY.—Late apples in plentiful supply, and fairly large stocks held by growers. Lemon market very bare, and good prices available. Taken all through, growers have realized a successful season.—*W. R. L. Williams.*

MANAWATU AND WAIRARAPA.—Fruit crops all picked, and growers quite satisfied with season's yield. Quantities of fruit are being stored for advance in prices.—*George Stratford.*

HASTINGS.—All fruit gathered, and fair quantity on hand. Orchard work is well in hand, and trees look very well for next season.—*J. A. Campbell.*

NELSON.—With few exceptions fruit-picking is finished for the season, and pruning has commenced. Orchard work is well in hand, and much new ground is being ploughed up for planting. Cool-storage space for fruit has been fully taken up this season, and more apples would have been stored had space been available.—*J. H. Thorp.*

THE HONEY CROP.

THE Director of Orchards, Gardens, and Apiaries Division has received the following reports on the honey-crop prospects from the Apiary Instructors :—

AUCKLAND.—Honey reports same as last month. The prices previously quoted are being maintained, with prospects of a rise. Most apiaries are now closed down for the winter.—*G. V. Westbrooke.*

WELLINGTON.—Prices for good-quality honeys still hold firm. Bulk honey is quoted at 4½d. per pound with the prospect of an advance. Small tots are selling at 6d. A good winter will materially help next season's crops.—*F. A. Jacobsen.*

DUNEDIN.—Honey is extremely scarce, none coming forward; as an indication of the shortage, prices in bulk are quoted at 5d. From a commercial point of view, there is no crop this season.—*E. A. Earp.*

WEATHER FOR MAY.

D. C. BATES.

DISTRICT NOTES.

Chiefly from Telegraphic Reports.

District.

1. The month opened with showery weather, and similar conditions prevailed during the last few days, otherwise fair weather was experienced with cold nights. The total monthly rainfall was less than half the average.
- 2, 3. Rainfall about 67 per cent. below the average, and mostly of a showery nature at the beginning, middle, and end of the month. There was an absence of high winds, and consequently foggy conditions were experienced at times, more especially in the latter half of the month. The mean temperature for the month was somewhat below the average.
4. The latter part of the month proved dull and showery, and some stations recorded heavy rain on the 15th. Fine and clear conditions prevailed generally from the 4th to the 15th. Precipitation, 23 per cent. below the mean for the month.
5. Only about a quarter of the average rainfall, mostly falling in the middle and end of the month, the wettest day being the 28th. Between the 2nd and 15th the weather was generally fair to fine and bright, and the inland portion of the district recorded frosts between the 7th and 14th. Some heavy showers fell on the 31st.
6. What little rain there was mostly fell on the last five days of the month, the total being only half the average. Fine weather ruled during the month.
- 7, 8. The rainfall was very light, the total ranging from 50 to 85 per cent. below the average. The month was free from strong winds, and several sharp frosts occurred inland in the middle of the month. Generally fair and mild.
- 9, 10. Except on the 17th, when a moderately heavy fall occurred in parts, the rainfall was of a showery nature. Fair and mild weather predominated, with a prevalence of light northerly winds. Rainfall was less than the average by from 24 to 45 per cent.
11. Rainfall from 30 to 40 per cent. below the mean fall for the month. Fine and clear weather prevailed between the 2nd and 8th, 21st and 26th; and fair to cloudy conditions were experienced, with passing showers at times during the remainder of the month.
- 12, 13. Showery in the beginning, middle, and end, but generally a fair month, with 50 per cent. below the usual May rainfall.
14. The first half of the month proved fine and dry, conditions which also prevailed between the 21st and 26th. The 28th was the wettest day, some places recording an inch and more, but the total rainfall for the month was generally only about half the average.
15. Some snow fell on the 17th, with a strong wind, and heavy rain on the 31st; but generally a fair calm month. Several foggy days occurred, and a few sharp frosts were recorded. Rainfall about three-quarters of the average.
16. The rainfall was about the average in the district, the maximum fall occurring on the 17th, mostly in the form of snow. This was followed by four nights of hard frosts.
17. Calm weather prevailed generally throughout the month, and on two-thirds of the nights frosts occurred. Total rainfall slightly below the average.



18. The total rainfall in this district was everywhere below the average, varying from 35 to 55 per cent. Fine weather predominated, interspersed with light showers and moderately heavy rain on the 17th. Frosts between the 2nd and 7th, and on the 24th and 25th.
19. About 25 per cent. below the average rainfall, mostly light showers. Fog and drizzle were experienced on the last two days of the month; but fair to fine weather ruled throughout the month, with some cold nights and frosts inland.
- 20, 21, In all Canterbury and North Otago the rainfall was considerably below the
22, 23, average, the weather having been remarkably fine, with bright sunny days,
24. and nights often frosty. But little wind was recorded. Most of the rain
fell in the middle of the month.
25. Though generally below, some parts of this district recorded slightly in excess
of the average rainfall, dull and showery weather having prevailed through-
out the month.

SHORT SUMMARY.

May, regarded as the last month of autumn in New Zealand, was this year very seasonable. The first two and the last two days were under the influence of westerly low-pressure areas; and in the north, on the 8th, 9th, and 10th, a cyclone was in evidence, but with decreasing intensity. Minor disturbances occurred during the month; but the winds were generally moderate, and the rainfall below the average.

It is said that an arrangement has been made for the purpose of relieving the glut of Argentine chilled beef on the English market. American and British interests have agreed to limit the supplies exported to England according to the consumption capacity of the markets.—*N.Z. Correspondent, Buenos Aires*, 19th March, 1912.

The total value of the exports in 1911 from New South Wales of primary produce and manufactured goods of that State amounted to £27,497,957. The principal destinations of the exports were: United Kingdom, £10,954,429; Ceylon, £1,291,012; New Zealand, £1,025,154 (total British possessions, £14,862,820); Germany, £4,235,906; France, £3,573,063; Belgium, £2,298,522.

The s.s. "Corinthic," which sailed from Wellington for London on the 16th May, in addition to the cargo for that port, loaded the following: From Hobart for Rio de Janeiro, 7,475 cases of apples; and for Monte Video, 7,725 cases. From Lyttelton, for Rio de Janeiro, 55 carcasses of mutton, 30 carcasses of lamb, 1 crate of kidneys, 6 crates of rabbits and hares, and 1,099 sacks of potatoes. From Dunedin, for Rio de Janeiro, 387 sacks of potatoes.

In a recent trade report by Trade Commissioner Suttor, of New South Wales, this gentleman spoke of the probability that the near future would see marked changes in China, and activity in the matter of woollen-factories. Exactly as woollen clothing is being introduced into Japan, so now it is finding its way into China; and the decree has gone forth that by the order and determination of the Government all the troops are to be clothed in woollen uniforms. The statistics for the imports of woollen goods into China equalled £430,065 in 1909, whereas the imports for 1910 increased by £124,196.—*New Zealand Government Agent at Sydney*.

ANSWERS TO CORRESPONDENTS.

SOME DAIRYING QUERIES.

MR. W. F. COOMBRIDGE, Te Kiri, writes,—

I should be very much obliged if the Department would, through its valuable *Journal*, treat upon the following questions.

Everyone is quite satisfied with the great value of culling cows by testing, but is the principle of paying out on the butter-fat for cheesemaking a right one? Take, for example, the Jersey supplier who delivers at factory 100 lb. of milk containing 5 per cent. of butter-fat, for which he receives 5s., and the Holstein or Ayrshire man who supplies 100 lb. of milk containing 3·5 per cent. butter-fat, for which he receives 3s. 6d., or a difference in favour of the Jersey of 1s. 6d. in every 100 of milk supplied, although from the lower-testing milk as much cheese is said to be made. Could this difficulty be overcome by allowing companies to skim milk down until it should contain an average of, say, 3·4 or 3·5 per cent. of butter-fat, which could then be made into cheese containing a fixed percentage of butter-fat?

Again, a company making butter decides to turn its skim-milk into casein. Would it be workable to pay the supplier for the actual casein contained in his milk, the same as he is paid for the butter-fat it contains?

Would the usual sample taken for butter-fat be sufficient for the casein test? Would the casein test entail much extra work for the manager?

The Dairy Produce Division replies,—

The principle of paying for milk for cheesemaking according to its butter-fat content is, generally speaking, a right one, because, as far as we have been able to ascertain, the fat and the casein (the two chief solid constituents of milk for cheese) are in a fairly constant and even ratio in the milk of herds as supplied to our cheese-factories. Exception may be taken to the milk of purebred Jersey cows, however, as the ratio of fat to casein is somewhat higher in this breed, but it is not correct to assume that an equal quantity of milk of the Jerseys and of the other two breeds cited will make an equal quantity of cheese; consequently the difficulty the inquirer speaks of is non-existent. Tampering with milk by skimming or by any other means to reduce the fat-content is not permissible. It is expressly laid down in effect that milk for the manufacture of whole-milk cheese shall be pure and as the cow gives it, to which nothing is added and nothing taken away. As a general rule the milk supplied to cheese-factories is mostly from herds of cows of mixed breeding. Herds of exclusive Jersey, Holstein, or Ayrshire blood are very much in a minority at present. The average quality of milk is about 4·0 per cent. fat-content, and in general cheese-factory practice to-day 100 lb. of such milk yields 10 lb. of commercial cheese ready for export. 100 lb. of pure Jersey milk testing 5 per cent. fat would possibly yield 12 lb. of cheese, and a like quantity of milk from the other two breeds would likely produce 9·1 lb. of cheese. The fairness or otherwise of paying by the butter-fat content only—bearing in mind the very small number of herds composed of nothing other than one of the special breeds named, and taking the value of milk at 1s. per pound butter-fat, which is equal to, say, 4·8d. per pound of cheese made—may be indicated in the following way:—

Milk.	Test.	Cheese Yield.	Value of Fat at 1s. per Pound.	Value of Cheese at 4·8d. per Pound.
lb.	Per Cent.	lb.	d.	d.
100	4·0	10	48	48·0
100	5·0	12	60	57·6
100	3·5	9·1	42	43·6

Your range of 1.5 per cent. difference in the fat-quality of the herds is rather a wide one. The actual range of difference is probably much less. To illustrate this further, however: If a cow of each breed, as represented by you, gives during a milking season milk in which is 200 lb. of fat, the yields and payments on the fat and also on the cheese-yielding basis would work out as follows:—

—	Milk.	Test.	Fat.	Value.	Cheese.	Value on Yield of Cheese.		
	lb.	Per Cent.	lb.	£	lb.	£	s.	d.
First cow	5,000	4.0	200	10	500	10	0	0
Second cow	4,000	5.0	200	10	480	9	12	0
Third cow	5,714	3.5	200	10	520	10	7	6

From a factory or manufacturing point of view these figures suggest that the dairy-farmer who is using milk from the third variety of cows is possibly doing himself much better justice than is the owner of the second breed of cows. In this connection it may be stated that at a co-operative cheese-factory in Taranaki, where a somewhat unusual proportion of the milk supplied is from herds of the Jersey stock, the company in conjunction with this Division are testing all milk received for both fat and casein. On the conclusion of the season's work the results will be available for publication. Whether the work of testing for both fat and casein is worth the time and energy it is necessary to spend on it in the Dominion is at this moment unsettled. Should it be demonstrated that it is inadvisable to use Jersey milk for cheesemaking, it is fair to assume that our dairymen generally will settle the question in a practical manner by using the milk for buttermaking, or by disposing of the stock to dairymen who have other uses than cheesemaking for the milk.

It would be quite workable to pay the supplier for the actual casein contained in his skim-milk; but it is very doubtful whether it would be worth while taking samples from the skim-milk for the purpose of ascertaining the casein-content, as the usual sample taken for ascertaining the butter-fat content would be sufficient for both purposes. The making of the casein test would entail about as much time as, or perhaps a little less than, testing for butter-fat.

DISEASE ATTACKING SUNFLOWERS.

A CORRESPONDENT writes,—

Last year I planted an acre in sunflowers. They came up well, but when they were about a foot high they began one by one to blacken and die. They continued until even now, and those that have seed-pads (as they may be called) keep rotting away. It seems like a mildew on them. What ails them? Is there a special disease which attacks them?

The Director of Orchards, Gardens, and Apiaries replies,—

It is not possible without specimens to say what disease is attacking the sunflowers. If one or two of the plants are forwarded here they will be examined, and a report sent you.

NITRO-BACTERINE.

L. A. M., Hastings, writes,—

Kindly inform me through your "Answers to Correspondents" how and where nitro-bacterine is obtainable, and the method of applying same to seed-potatoes; also what kind of artificial manures to apply to the soil when seed-potatoes are treated with nitro-bacterine.

The Fields and Experimental Farms Division replies,—

Nitro-bacterine is obtainable from the *Review of Reviews* office, Melbourne, or from J. A. Lutz, indent agent, Bank Chambers, Lambton Quay, Wellington, N.Z. Nitro-bacterine cannot be recommended as a fertilizing agent for potatoes.

It is usually advertised as a fertilizer for leguminous plants only. Speaking generally, the main fertilizing ingredient required in this country is phosphoric acid. Nitrogen is not required to anything like the same extent.

THOUSAND-HEADED KALE.

“THOUSAND-HEAD,” Auckland, writes,—

Could you please answer the following question through the medium of your valuable *Journal*: If milking-cows were fed on Thousand-headed kale judiciously—that is for, say, only two or three hours immediately after milking—would the milk be tainted so that a factory would be likely to refuse it, and if so, would the fact that the cream is pasteurized at the factory—I supply a factory which only deals with home-separated cream—be sufficient to nullify any undesirable flavour?

The Director of Dairy Produce Division replies,—

If Thousand-headed kale is fed to cows immediately after milking, and in reasonable quantities, the milk and cream should not be affected detrimentally in flavour. Pasteurization is always helpful in minimizing flavours that are caused by the feed the cows may be eating, although it is by no means a cure for all the defects in milk or cream.

SHELTER TREES.

MR. WM. G. FRY, Punga Iwi, Feilding, writes,—

What trees would you advise planting in small belts for shelter for stock? Could I plant anything that could be cut out in the future for fencing timber? Would there be any danger of common wattle spreading?

The land was originally heavy bush. Part of it is light and rather stony on a loose subsoil: the rest is fairly heavy clay land. When would you advise planting?

The Director of Orchards, Gardens, and Apiaries replies,—

I would recommend the planting of *Acacia decurrens* (Black-wattle). This variety does not sucker like the Silver-wattle (*Acacia dealbata*), which, on account of its suckering propensities, is not recommended for planting on farms or home-steads. *Acacia decurrens* is a quick-growing tree, and the timber is useful for posts, &c., and also makes excellent firewood. It should be raised from the seed, which should be sown in the spring where the trees are to grow permanently, in well prepared land. The quantity of seed required will be at the rate of $\frac{3}{4}$ lb. per acre. Overnight from twelve to twenty-four hours before planting pour boiling water into a vessel, and at once tip the wattle-seed into it. The steeping will cause germination to commence, and also the exudation of a certain amount of gum. The gum should be washed away, two or three changes of water probably being required to do so effectively. The seed should then be spread out to dry for, say, half an hour, care being taken that the exposure is not sufficiently long to do more than to remove the moisture from the outside of the skin, and not in any way to check the germination already commenced. If there should still be any trace of stickiness left a light sprinkling of wood-ashes will correct it. In this condition the seed can now be drilled into the prepared land to a depth of $\frac{1}{2}$ in. in two rows 6 ft. apart, with bonedust added at the rate of 1 cwt. per acre.

GRASSES, SHEEP, AND SHELTER-TREES.

“TUSsock,” Fairlie, writes,—

I have a fairly large area of pastoral country lying from 2,000 ft. to 4,000 ft. above sea-level. There is a good extent of fairly easy tussock downs; but, as the previous owner evidently burnt the country off every time he got a chance, there is not too much tussock left in places, and very little grass anywhere. The land is mostly stony, with a few inches of black soil in places; elsewhere there is a yellow clay; but on the whole it can be said that as far as appearances go there is sufficient soil to form a seed-bed

over most of it. In addition to a small kind of tussock an equally small variety of capeweed seems to be the only plant able to grow in places. As I am anxious to improve the carrying-capacity of the land, I would be glad if you could give me any advice likely to be of service. Would any of the following grasses prove suitable for surface growing, and when would you sow: Kentucky blue-grass, couch-grass, crested dogstail, cocksfoot, yarrow, small yellow trefoil, white clover, and timothy in damp or swampy places? Would the native grass growing on the hills around Wellington, and forming such a thick sward, be likely to do well? Would it be advisable to plant gorse or broom along the creek and river-beds? Is there more than one variety of gorse, and, if so, which is the best to plant for sheep-feed? What quantity of seed would I need to sow to the acre, and should I refrain from burning in future? Would light or heavy stocking make much difference on such country as I have described?

I should also be glad if you would inform me if there is any standard work published dealing with the half-bred sheep, and, if so, where it is obtainable, and also what are the chief drawbacks of the Corriedale compared with the first-cross half-bred.

As I am building a homestead, I would be glad if the names of a few shelter-trees likely to succeed in this district could be supplied.

The Fields and Experimental Farms Division replies,—

The Department itself is now but testing many varieties of grasses on similar country. It would therefore be premature to advise until it has satisfied itself in the first instance. The experimental plot near Whaleback, in Mackenzie country, may be of interest to this correspondent, and is not too great a distance from the Inspector at Fairlie. Mr. Manning, Inspector of Rabbits and Noxious Weeds, Fairlie, will be pleased to supply any information regarding this and other experimental plots to any one interested.

The Live-stock and Meat Division replies,—

On suitable country the Corriedale is an excellent sheep for all-round purposes. Being still more or less in the evolutionary stage, more skilful management is necessary in selection, mating, and culling, to maintain a good Corriedale flock than may be essential in the case of half-breds, the demand for which is in excess of the supply. I am not aware of any standard work on half-bred sheep.

The Director of Orchards, Gardens, and Apiaries replies,—

The following trees should prove very suitable for shelter planting in your district: *Pinus muricata* (Bishop's pine), which is a dense-growing tree, is one of the best for shelter planting; *Pinus austriaca* (Austrian pine), splendid shelter-tree, timber suitable for posts; *Abies Douglasii* (Douglas fir), timber valuable; *Pinus ponderosa* (Bull pine).

GRASS-GRUB.

W. PETRIE, Foxton, writes,—

Will you kindly advise me of the best method of killing the grass-grub. My lawn sown down last May is badly affected, at present in one place. The grubs are very plentiful about an inch below the surface. If you can advise me of a cure I shall feel very much obliged.

The Biologist replies,—

I should advise digging the infested patch in your lawn and dressing the same with a soil-fumigant, such as Vaporite or Apterite, at the rate of 3 cwt. per acre. In not less than six weeks' time sow down with Cheving's fescue and keep well rolled during the summer. Vaporite is now sold very widely throughout New Zealand.

OATS AND VETCHES.

"SUBSCRIBER," Cambridge, writes,—

In February last I sowed some Algerian oats and vetches mixed, with them 3 cwt. of manure to the acre. The oats and vetches grew all right until about the beginning of

April; but since then the vetches have withered up, and the oats have gone more or less brown and rusty, as per enclosed sample. I should esteem it a favour if you could tell me what is wrong.

Last year I sowed Italian rye-grass, and before the season was over it died out. It is rolling land with about 5 in. of light soil upon a semi-clay subsoil. When it was in its virgin state it grew fern and tea-tree.

The Biologist replies,—

The specimens have been carefully examined; but nothing found on them that could account for their withering away. One naturally would suspect some deficiency in the soil to be the primary cause of the failure. It would be well to have analysis of the soil in which the crop was grown made. The forms giving directions in connection with the taking and forwarding of samples have been posted to you.

GRASSES.

MR. A. D. WILSON, Pokokini, Homewood, writes,—

Will you kindly say whether *Danthonia pilosa* or *D. semiannularis* is the better grass for general use, or if there is any material difference between them. I find *Paspalum dilatatum* succeeds very well here after a new burn, either bush or fern, and does not seem at all to object to growing on rather dry ground. I have tried *Phalaris bulbosa* on a small scale, and my experience makes me think it will not stand close feeding with sheep. Probably it might be useful in a cow-paddock.

The Fields and Experimental Farms Division replies,—

Danthonia pilosa is a better feeding grass than *D. semiannularis*. The main quantity of the danthonia in Marlborough is composed of various forms of *D. pilosa*. The seed of *D. pilosa* is much larger than that of *D. semiannularis*. In growth *D. pilosa* is shorter than *D. semiannularis*, but it gives really a larger amount of herbage when kept well grazed. *Phalaris bulbosa* would probably be more useful in a cow-paddock until it gets firmly established.

PREPARATION OF TENNIS-COURT.

“INTERESTED,” Te Kuiti, writes,—

Please reply through your correspondence columns to the following questions:—

(1.) I am putting down a tennis-court on new country; the soil is light and rather sour. Would you advise a liberal dressing with lime now, and sow the seed, say, in September with basic slag?

(2.) What grasses would be the best to sow?

The Fields and Experimental Farms Division replies,—

(1.) I would advise a liberal dressing of lime now. The seed could be sown in September as suggested, but slag gives best results when applied in autumn.

(2.) On land that is inclined to be sour there is no better grass for lawn-making than florin. I should advise its being sown pure. The old idea of having large quantities of grasses in lawn-mixtures is rapidly dying out. Nearly all our best lawns are composed of one grass only. On heavy clay land Chewing's fescue is recommended, but it requires a large amount of labour to keep it suitable for playing on. Florin for lawns should be sown at the rate of 40 lb. per acre.

TREES FOR SHELTER.

J. K. ORMOND, writes,—

I have tried planting macrocarpa trees these last two seasons, and out of 190 planted only six have survived. My land is flat, heavy, clay land, poorly drained, but I expect to have it better drained this season. I would like advice through the *Journal* as to

the most suitable kind of tree to raise for shelter, and the proper time to plant. One of my neighbours planted some of the blue variety a few years ago. They grew strong, but are dying off—something immediately below the ground cutting them.

The Director of Orchards, Gardens, and Apiaries replies,—

The following trees are recommended as suitable for planting for shelter in your district: *Abies Douglasii* (Douglas fir); *Pinus muricata* (Bishop's pine), a dense-growing tree, and one of the best for shelter; *Pinus austriaca* (Austrian pine), timber suitable for posts; *Acacia decurrens* (Black-wattle), best grown from seed, which should be planted where the trees are to grow—timber excellent for posts and firewood. No doubt the lack of success you have experienced in planting shelter trees is due to want of sufficient drainage or to floods. There are but few trees that will succeed for any length of time if the soil conditions, especially with regard to drainage, are unsuitable. The present time is very suitable for tree-planting where the ground is not too wet.

WILD LINSEED.

"SUBSCRIBER," Rainham, writes,—

Could you tell me whether the seed of wild linseed (in hay) will grow after being eaten by cows or horses. Which is the best way to kill wild linseed?

The Live-stock and Meat Division replies,—

As this seed is of a mucilaginous nature, digestive changes would take place which would destroy its germinating-power.

The Fields and Experimental Farms Division replies,—

Wild linseed or Australian flax (*Linum marginale*) is mainly a weed of the North Island only. It is difficult to control in pastures, but on cultivated land ploughing in the autumn with good cultivation until the time the crop is sown is effective. As it is a deep rooter it does not derive much nourishment from a top dressing, so that on pastures a top dressing applied to stimulate the growth of the grass will help to crowd it out. Wild linseed is often common on waste places, and when in such localities it should be cut before flowering to avoid seeding.

CRUSH-PEN FOR CATTLE.

MR. H. MUNRO, Wellington, writes,—

Can you please let me know the dimensions, structure, &c., of a crush-pen for cattle.

A plan prepared by the Live-stock and Meat Division appears on another page.

RAISING CATALPA AND MACROCARPA FROM SEED.

MR. STEPHEN ANTHONY, Waitete, Amodeo Bay, Auckland, writes,—

I received some seeds of the *Catalpa speciosa* from Mr. H. C. Rogers, of Mechanicsburg, Pa., U.S.A. I should be thankful if you would be good enough to give me some information as to how to plant them, and when. Also, I have had bad luck in raising young macrocarpa-trees from seed. Should they be soaked in hot water, and if so, for how long, and how hot should the water be to begin with? Also, when is the best time to plant them?

The Director of Orchards, Gardens, and Apiaries replies,—

Catalpa speciosa can be raised from seed provided it is sown thinly and lightly covered with soil. September is a suitable time for planting the seed, which should be sown in a proper seed-bed or in shallow boxes. When the plants are about

12 in. high they can be transplanted into their permanent places. The catalpa, however, to be grown successfully requires a well-sheltered position. The seed of macrocarpa (Monterey cypress) should not be soaked in hot water before sowing. This is only necessary with hard-shelled seeds, such as acacia, &c. The seed should be sown about September.

FRUIT VARIETIES RECOMMENDED.

MR. A. WAWMAN, Waitoa, Thames Valley, writes,—

I am getting land ready for an orchard. Kindly state the best kinds of apples, pears, plums, and peaches for about two acres for home use.

The Orchards, Gardens, and Apiaries Division replies as follows,—

The following would be suitable varieties for planting the area referred to: Apples—Beauty of Bath, Gravenstein, Golden Pippin, Jonathan, Delicious, McLiver's Winesap. Pears—Wilder, Beurre Diel, Doyenne du Comice, Louise, Bonne of Jersey, Williams Bon Chretien, Winter Cole. Peaches—Brigg's Red May, Wiggins, Paragon, Muir, Kia Ora, Kalamazoo. Plums—Early Orleans, Jefferson's, Kirke's, Grand Duke, Coe's Golden Drop.

PLANT-BREEDING.

T. B. H., Nelson, writes,—

Will you please recommend me through the columns of your *Journal* a good work for beginners on plant-breeding, seed-selection, &c., more particularly in connection with agriculture and vegetables, also stating where obtainable in New Zealand.

The Biologist replies,—

You are recommended to procure a copy of L. H. Bailey's "Plant Breeding," publishers, Macmillan and Co., London, price 6s., obtainable at all the leading booksellers.

MANURE FOR SHELTER TREES.

MR. C. A. PERHAM, Greytown, writes,—

Will you kindly answer the following question for me: I have some shelter belts planted, which I am anxious to force along, but am rather afraid to use artificial manures. The trees are *Pinus insignis*, and I thought of using basic slag, but would like your opinion first.

The Orchards, Gardens, and Apiaries Division replies,—

Should suggest using bonedust and superphosphate. Basic slag is a valuable fertilizer, but takes longer than the abovementioned in producing results.

APPLE-DRYING.

MR. THOS. S. MASON, "Grand View," Ettrick, writes as follows,—

Recognizing the ready manner in which you come to the assistance of those in need of information, I would be pleased if you would give me some information on apple-drying, or put me in the way of obtaining same—say, probable cost of outfit, where procurable, &c., and whether heat is necessary during the process.

The Director of Orchards, Gardens, and Apiaries replies,—

A very simple apparatus is necessary for drying apples. If the operation is to be on a domestic scale only, a series of, say, six trays, the frames of wood, the

bottoms of galvanized wire, are procured, each tray, say, 18 in. by 12 in. over all. A sheet-iron oven is made, but with no bottom; strips of iron to carry the shelves are fixed along the side. There is a hole in the top to let steam out. This oven is set on the kitchen stove. As the apples on the bottom tray dry the top tray is made to change places, and so on until the whole are uniformly dry. To prepare the apples they are pared, cored, and cut into thin slices or rings. These are dropped into salt and water for a few minutes, and drained and placed in thin layers in the drier.

CLEARING RUSHES, AND LIMING.

MR. P. C. NEILSEN, Mangamaire, writes,—

Could you tell me how to clear my land from rushes. The land has now been properly drained. Would it be advisable to burn them off, and, if so, what would be the best month to do it in? After that, would it be a good plan to give it a coat of agricultural lime? What quantity is required, and what month is the best to do it? The land is covered with stumps and logs, and I cannot plough it.

The Fields and Experimental Farms Division replies,—

On land that cannot be ploughed the clearance of rushes is difficult. The best means is to burn them. It is usually found best to grub them during spring, and they will then be found in a suitable condition to burn some time in March, after which the land should be hand-sown with grass-seed.

It is not recommended that a large area of land be treated with lime until it has been ascertained by experiment what results will follow such a course.

I should advise setting aside a small portion of the land and giving it a test dressing at the rate of about 1 ton of lime per acre. It would probably be found best to apply the lime in the autumn. It is suggested that adjacent to the plot treated with lime, a portion, say, 1 acre, be treated with basic slag at the rate of 3 cwt. to 4 cwt. to the acre. This would provide a valuable demonstration as to which treatment gives the best results.

RACE-BAILS FOR COWS.

MR. W. H. LOWE, Maihihi, Otorohanga, writes,—

Could you kindly inform me through the *Journal* the measurements of race-bails to hold five cows each side.

The Director of Dairy-produce replies,—

A race milking-shed to hold five cows on either side should measure 43 ft. in length, and a total width of 10 ft. 9 in. (inside measurement). The width of each cow's compartment should be 2 ft. 3 in., and the length 6 ft.

Plans of this type of shed, as well as of a number of other designs, are to be had on application to this Division, and a copy of the race shed is being sent you.

The distributive sales of the Swift Beef Company for 1911 totalled \$275,000,000, or, say, £55,000,000. The company purchases annually in the United States 7,500,000 head of live-stock.—*Meat Trades Journal*.

Importing about £18,000,000 worth of wool annually, Germany is much pleased over the success of breeding sheep for wool in German South-west Africa. It is believed that the wool industry can be enormously developed in that colony.—*Spokesman Review*.

SHIPMENTS OF PRIMARY PRODUCE FROM NEW ZEALAND TO UNITED KINGDOM.
COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.	Mutton. Carcases.	Lamb. Carcases.	Beef. Quarters.	Butter. Boxes.	Cheese. Crates.	Wool. Bales.	Wheat. Sacks.	Ons. Sacks.	Rabbits. Crates.	Hemp. Bales.	Tow. Bales.	Kauri- gum. Cases.	Sundry.
January,	1912 237,284	302,399	12,424	114,512	64,005	95,994	..	..	7,295	6,365	1,942	3,407	59 carcasses pork.
"	1911 175,337	287,120	13,568	90,405	46,375	127,199	..	16	399	15,234	3,302	7,094	590 "
February,	1912 208,424	273,246	13,052	101,544	62,398	106,074	607	..	..	6,831	1,615	1,056	..
"	1911 242,090	450,406	24,924	86,368	46,667	70,030	23,694	200	..	4,428	1,302	2,113	1,369 carcasses pork.
March,	1912 324,192	518,402	20,201	64,925	49,308	70,022	..	4,980	..	3,832	1,952	2,644	16 carcasses pork.
"	1911 264,297	665,822	26,657	45,912	40,668	58,362	40,276	..	..	3,650	1,583	8,982	2,408 "
April,	1912 213,178	355,829	7,046	38,986	38,137	31,615	4,905	2,180	..	5,134	1,958	4,458	..
"	1911 172,563	491,413	19,106	14,823	33,411	42,917	38,456	6	..	9,233	1,827	2,577	2,431 carcasses pork.
May,	1912 454,506	744,287	32,631	1,441	40,535	51,833	11,157	26,569	1,500	11,963	2,826	6,287	..
"	1911 204,330	377,105	20,173	995	20,732	33,033	93,854	..	..	7,443	1,210	7,720	1,087 carcasses pork.
June,	1911 214,073	448,432	15,789	..	6,323	19,568	39,432	..	14,128	4,763	525	5,528	2,434 carcasses pork.
"	1910 290,596	555,777	60,286	485	17,963	21,260	13,707	..	8,988	6,180	2,684	7,104	658 "
July,	1911 206,869	260,761	14,296	..	276	14,100	29,452	..	10,334	6,032	1,073	2,786	175 carcasses pork.
"	1910 249,906	334,753	71,160	..	595	12,816	20,604	1,106	8,649	6,695	1,437	8,272	2,446 "
August,	1911 66,603	110,054	3,653	..	..	5,260	31,976	..	18,231	3,443	303	3,475	203 carcasses pork.
"	1910 94,468	97,899	16,440	634	..	5,381	33,970	273	22,639	1,378	720	6,793	362 "
September,	1911 102,081	40,057	6,059	6,404	..	7,390	38,151	..	33,059	5,604	393	7,672	220 carcasses pork.
"	1910 104,925	26,416	8,420	22,644	41	6,539	40,876	3,863	7,721	2,680	597	1,632	255 "
October,	1911 9,417	2,043	100	49,626	11,501	2,182	..	..	32,094	4,514	754	2,982	..
"	1910 49,010	800	10,531	60,014	9,159	3,189	94,815	23,330	36,947	3,632	1,232	3,089	56 carcasses pork.
November,	1911 47,770	10,427	403	135,741	57,319	44,934	15,893	..	16,806	7,844	2,183	3,085	..
"	1910 62,926	29,877	5,554	105,759	27,749	55,551	76,594	331	29,646	6,850	2,300	4,339	911 carcasses pork.
December,	1911 72,192	91,965	765	109,397	46,883	54,297	..	..	4,366	5,719	1,364	2,708	..
"	1910 82,405	157,172	13,155	182,051	67,162	59,080	..	..	9,716	4,524	109	5,363	686 carcasses pork.

HEMP AND TOW GRADING RETURNS.

MAY, 1912.

Hemp.—The total number of bales graded was 9,931, as compared with 7,777 bales for the corresponding month of last year, an increase of 2,154 bales. For the twelve months ending 31st May, 1912, the number of bales graded was 90,529 as compared with 101,253 for the previous twelve months, the decrease being 10,724 bales.

Tow.—During the month 2,814 bales were dealt with, as compared with 2,276 for the corresponding month of last year, an increase of 538 bales.

HEMP AND TOW GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF MAY, 1912.

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.	Common.	Rejected.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland	272	585	62	..	..	919
Napier	111	7	..	..	..	118
Foxton	8	1,446	2,887	69	7	..	4,417
Wellington	54	2,643	1,116	29	12	..	3,854
Blenheim
Pictou	41	4	47	..	..	..	92
Lyttelton
Dunedin	217	19	..	..	..	..	236
Bluff	287	6	2	..	295
Totals	320	4,495	4,929	166	21	..	9,931
Percentages of totals	..	3.22	45.26	49.63	1.67	0.22	..	100

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	10	168	180	20	378
Napier ..	65	..	..	..	65
Foxton ..	266	652	16	..	934
Wellington ..	671	561	41	9	1,282
Blenheim ..	..	..	..	..	..
Pictou ..	19	..	..	..	19
Lyttelton ..	..	..	..	..	..
Dunedin ..	..	3	..	..	3
Bluff ..	..	55	64	14	133
Totals ..	1,081	1,439	301	43	2,814

Stripper-slips.—Wellington, passed for shipment 160, condemned 12; Foxton, passed for shipment 117: total 289.

STOCK EXPORTED.

MAY, 1912.

THE following table shows the numbers and descriptions of stock exported from the Dominion :—

Port of Shipment.			Horses.		Cattle.		Sheep.		Swine.	
			To Australia.	To Pacific Islands.	To Singapore.	To Australia.	To Pacific Islands.	To India.	To Pacific Islands.	
Auckland	..	..	20	32	..	..	14	..	34	..
Gisborne	..	..	3	..	..	..	..	..	..	76
Napier	..	..	..	..	..	..	..	..	..	..
Wellington	..	..	3	..	..	..	32	..	..	..
Lyttelton	..	..	14	..	..	..	150	..	..	..
Dunedin	..	..	25	..	..	..	..	..	..	..
Bluff	..	..	20	..	..	..	..	..	..	..
Totals	..	..	85	32	..	..	14	182	34	..
										76

Following are particulars of the horses shipped : 64 draughts (38 stallions, 10 mares, 9 geldings, 2 colts, 5 fillies), 10 thoroughbreds (1 stallion, 5 mares, 1 gelding, 3 foals, 1 hackney stallion, 40 light horses (31 mares, 9 geldings), 2 pony geldings.

STOCK IN QUARANTINE.

THE following stock was received into quarantine during the month of May :—

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
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MOTUIHI ISLAND (AUCKLAND).

1	White French poodle dog	Male	..	Vancouver	Mrs. J. Laird	..	Sydney.
1	Pug dog	..	..	Toowoomba	G. Boardman	..	Auckland.
1	Black spaniel	..	..	Suva	H. Mercer	..	"

SOMES ISLAND (WELLINGTON).

3	Hereford	..	Bulls	..	Sydney	..	Hastings.
1	Collie	..	Female	..	Liverpool	..	Bulls.
7	Pups.						

PRODUCE IMPORTED.

THE following return, compiled by the Customs Department, shows the total importations into New Zealand during the month of May of agricultural and farm products :—

Item.	Quantity.	Value.
		£
Bran	tons	..
Butter	8 cwt.	48
Cheese	9 cwt.	54
Chaff	tons	..
Fruits, fresh, all kinds	934,883 lb.	6,626
Barley	127 centals	79
Oats	39 centals	40
Wheat	2 centals	1
Onions	211 cwt.	77
Pollard and sharps	tons	..
Potatoes	tons	..
Seeds, grass and clover	241 cwt.	635
Total values imported .. .. .	..	£7,560

ARGENTINE TRADE WITH BRITAIN.

THE Department has received the following cablegram from Buenos Aires, dated 6th June, 1912 :—

The following shipments of produce were despatched from the Argentine to United Kingdom ports during May, 1912 (compared with May, 1911) :—

	1912.	1911.
Frozen beef (quarters)	153,000	160,788
Chilled beef (quarters)	209,000	173,569
Frozen mutton (carcases)	171,000	209,533
Frozen lamb (carcases)	109,000	65,749
Butter (cwt.)	275	Nil

AGRICULTURAL-SHOW DATES.

THE WINTER FIXTURES.

June 25-28. National Dairy Show, at Palmerston North.

Aug. 12-17. National Agricultural Show of Queensland, at Brisbane.

Secretaries of rural show societies in general are requested to forward the dates of the shows of their organizations as soon as available, for notification in this *Journal*.

THE BRITISH PRODUCE MARKET.

HIGH COMMISSIONER'S CABLED MARKET REPORTS.

THE Department has received the following cablegrams from the High Commissioner for New Zealand. (NOTE.—Quotations, unless otherwise specified, are average market prices on spot.)

London, 11th May, 1912.

Mutton.—The market is quiet, but firm. Nominally, Canterbury 4½d., North Island 3½d., per lb.

Lamb.—The market is active, with a good demand. Prices are firm. The market has been favourably affected by the shortage of home supplies, and a decline of 23 per cent. of imports during the year. The weather continues favourable. Canterbury 6d., other than Canterbury 5½d., per lb.

Beef.—The market remains firm, and a good demand continues. Best quality is scarce. New Zealand hinds 4½d., fores 3½d., per lb.

Butter.—The market is steady, with an improved demand. The decline is checked, and on the whole prices are slightly better this week. Choicest New Zealand butter to-day is 111s., Danish 115s., Siberian 106s., Argentina 105s., Australian 106s., per cwt.

Cheese.—There is a better demand. The market is firmer. New Zealand white 70s. to 71s., coloured 71s. to 72s., per cwt.

Hemp.—The market closed firmer, with more inquiry. A good business has been done. New Zealand good-fair grade, spot, £22, New Zealand fair grade £20 15s., per ton. Forward shipment about the same. Manila: The market is steady at previous quotations—viz., spot, £21 15s., forward shipment £22, per ton. The output from Manila for the week was 33,000 bales. Stock New Zealand hemp, 268 tons.

Wool.—The market remains firm.

London, 18th May, 1912.

Mutton.—The market is steady, with a very good demand. Canterbury 4d. to 4½d., North Island 3½d. to 4d., per lb.

Lamb.—The market is firm. There is a good demand for all lamb. Canterbury 6½d., other than Canterbury 5½d., per lb.

Beef.—The market is firm. Moderate supplies coming forward. New Zealand hinds 4½d., fores 3½d., per lb.

Butter.—The market is firm. There is a good demand for all descriptions, and prices are advancing. Choicest New Zealand 113s., Australian 108s., Danish 120s., Siberian 109s., Argentina 107s., per cwt.

Cheese.—The market is firm, and there is a good demand. Stock is moderate. New Zealand white 72s. 6d., coloured 73s. 6d., per cwt.

Hemp.—The market is quiet, and prices slightly weaker. Spot—New Zealand good-fair grade £21 15s., fair grade £20 10s., per ton. Forward shipment at the same price. Spot—Fair current Manila, £22 per ton. Forward shipment, £22 10s. The output from Manila for the week was 24,000 bales.

Hops.—The market is firm, with hardening tendency. There is great demand in the market.

London, 24th May, 1912.

General.—The market is paralysed on account of the strike of transport workers. Prices are rising for anything available. Ships cannot discharge. Quotations are nominal.

Mutton.—Canterbury 4½d., North Island 4½d., per lb.

Lamb.—Canterbury 7d., other than Canterbury 6½d., per lb.

Beef.—New Zealand fores 4d., hinds 4½d., per lb.

Butter.—New Zealand choicest, 115s. per cwt.

Cheese.—The average price for the week for finest New Zealand is, white 73s. 6d., coloured 74s. 6d., per cwt.

Hemp.—No change in prices, namely : Spot—New Zealand good-fair grade £21 15s., fair grade £20 10s., fair current Manila £22. per ton. Forward shipment : New Zealand good-fair grade £21 10s., fair grade £20 10s., fair current Manila £22 10s., per ton.

London, 1st June, 1912.

General.—The markets are very unsettled on account of the continuation of the strike. Employers have decided to resist the strike. New Zealand meat and dairy-produce cargoes cannot be discharged. Traders are drawing from stock at present in store. The Government has been requested to assist in sustaining the food-supply by affording protection during delivery from ships. Prices are nominally high for any thing available.

Mutton.—Canterbury 4½d., North Island 4½d., per lb.

Lamb.—Canterbury 7½d., other than Canterbury 6½d., per lb.

Beef.—New Zealand hinds 4½d., fores 4d., per lb.

Butter.—The supply of Home, Continent, meets the demand. Choicest New Zealand butter, 115s., per cwt.

Cheese.—The average price for the week for finest New Zealand cheese is 78s., English Cheddar 92s., per cwt.

Hemp.—The market is steady. Spot—New Zealand good-fair grade £22, New Zealand fair grade £20 10s., per ton. Forward shipment about the same. The market is a shade weaker for Manila. Spot—Fair current Manila £21 15s., forward shipment £22, per ton. The output from Manila for the week was 34,000 bales.

Wheat.—The market is quiet, with a tendency in favour of buyers.

Oats.—The market is dull ; very little business doing.

Peas.—The market is firm, with an upward tendency.

Beans.—The market is very quiet.

Wool.—The market remains firm. Current quotations for Bradford tops : 36's, low crossbreds, 1s. 1½d. ; 40's, low crossbreds, 1s. 0½d. (?) ; 44's, medium crossbreds, 1s. 2½d. ; 50's, halfbreds, 1s. 5½d. ; 56's, quarterbreds, 1s. 7½d. ; 60's, merinos, 2s. 1d., per lb.

Cocksfoot-seed.—The market is dull. Buyers are not keen to do business in cocksfoot-seed.

Mutton and Lamb.—River Plate shipments received during May, 1912 :—

					Mutton. Carcases.	Lamb. Carcases.
London	..	..	..	..	54,223	7,332
Liverpool	..	..	..	..	64,425	23,761
Hull	..	..	..	..	10,182	67
Cardiff	..	..	..	..	7,645	..
					136,475	31,160
May, 1911	..	..	..	..	261,020	159,608

The orchard-area of the Dominion has increased during the last four years by 7,413 acres. The estimated planting of this year should bring the total area under fruit-trees in the Dominion up to 35,967 acres.

From the 7th March to the 2nd May 13,670 cases of fruit, chiefly apples, were exported from the Dominion. Of this quantity 4,999 went to South America, all from the Nelson District. For South America orders are in hand for several thousand more cases.

JOURNAL

OF

DEPARTMENT OF AGRICULTURE.

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VOLUME IV.

— — — — —

GENERAL INDEX.

A.

Abnormal development of oat-head, 171.
 Abortion (contagious) in dairy cows, 237.
Acacia Baileyana, 96.
Acacia decurrens (black-wattle), 415.
 Adulterated wine, 390.
 Agricultural-show dates, 333, 424, 540.
 Ailments of animals (—see Diseases).
 Ailments of the farm dog, 369, 463.
 Anglo-French wheats, 312.
 Animal diseases, pests, &c. (see Diseases).
 Answers to correspondents, 78, 157, 229, 323, 415, 529.
 Apiary, the, 52, 137, 205, 279, 394, 495.
 Apiculture—
 Beekeepers' associations, 397.
 Beeswax-production, 396.
 Bulletin for distribution, 397.
 Control of bees, 495.
 Diseases of bees, 394.
 Enemies of bees, 395.
 Extracting honey, 52.
 Feeding, 207.
 Foul-brood in North Otago, 397.
 "Hand" swarm-controlling hive, 396.
 Honey cappings-press, 279.
 Monthly notes, 52, 158, 205, 279, 394, 495.
 Reports on honey prospects, 156, 228, 329, 424, 525.
 Requeening, 137.
 Robbing, 207.
 Swarming, 158.
 Transfer of bees, 206, 416.
 Uniting one colony with another, 205.
 Winter treatment of bees, 497.
 Apples—
 Cool-storage of, 61.
 Drying, 535.
 Export trade in, 271.
 Packing, 32, 489.
 West Canadian, 120.

Appreciation, 317, 367, 380.
 Argentine—
 Competition in lamb export trade, 253.
 Trade with Britain, 85, 234, 333, 540.
 Trade with Europe, 432.
 Artichokes (Jerusalem), 503.
 Australian—
 And Austrian steamship service, 336.
 Frozen lamb in Germany, 428.
 Mutton importation into Germany, 319.
 Wheats, 312.
 Wheat standard, 432.
 Ayrshires—
 Cow "Eileen," property of Mr. G. D. Mode, Ontario, Canada, 476.
 Imported by Department, 180.
 Milk record, 26.

B.

Bacterine (nitro), 530.
 Bails (race) for cows, 536.
 Barley—
 At Moumahaki, 260.
 Swedish, 312.
 Basic slag, 19, 418, 454.
 Bean (field or horse), 471.
 Bee-culture (see Apiculture).
 Beef trade, the second-quality article 359.
 Beet (—see Silver-beet).
 Bidabid, 81.
 Birdsfoot trefoil, 413.
 Bisulphide of carbon, destruction of rabbits with, 474.
 Black and grey hairs in wool, 107.
 Bonedust, 418.
 Breeding (plant), work on, 535.
 Britain, Argentine trade with, 85, 234, 333, 540.

British market—

- For eggs, 322.
- For fruit-pulp, 320.
- For pork, 47.
- Question of condemned meat on, 199.
- Reports, 87, 163, 235, 334, 434, 541.

British produce imports, 429.

Bromus inermis, 413.

Brown-top, 324.

Buda kale, 10, 450, 469.

Burnet, 413.

Butter—

- Californian market, 178.
- Fishy flavour in, 1.
- New Zealand, 101.
- Quality, 179, 483.
- Salting, 323, 417.
- Vancouver market, 428.

C.

Cabbages, 213, 503.

Caerphilly cheese, Home market for, 184.

Calf-trouble, 79.

Californian—

- Butter market, 178.
- Thistle, eradication of, 390.
- Thistle, field for investigation, 346.

Canadian—

- Ayrshire, 476.
- Markets, 133, 475.
- Wheats, 313.

Canker (ear) of the dog, 466.

Carbide (waste) as fertilizer, 417.

Carbon bisulphide, destruction of rab bits with, 474.

Carrots, 503.

Casein—

- Factory payment for, 529.
- Grading of, 162.
- Method of manufacture, 274.
- Test, 529.

Catalpa, 534.

Cauliflowers, 212, 503.

Central Otago revegetating experiments, 308, 377.

Cereals—

- Experimental, 312.
- Experiments with, at Marton, 10.
- Cheap feeding-trough, 195.

Cheese—

- Basis of factory payment of milk for, 529.
- Club, 383.
- Quality, 179, 483.
- (Soft) making, 30, 78, 112, 267, 481.

Chewing's fescue, 413.

China, development of woollen manufacture in, 528.

Chou moellier—

- At Moumahaki, 117.
- At Rurikura, 25, 450.
- Experiments at Belfast, Canterbury, 303.

Chrysanthemums, 506.

Clearing rushes, 536.

Clover—

- (Red), 16.
- Trials on gum lands at Kumeu, 518.

Club cheese, 383.

Club-root, 229, 486.

Cocksfoot, 159, 413.

Collar-rot of lemon, 157.

Conception, failure of, in dairy cows, 242.

Condemned meat in Great Britain, 199, 234.

Contagious abortion in dairy cows, 237.

Cool-storage of fruit, 59.

Co-operative experiments (see Experiments).

Correspondents, answers to, 78, 157, 229, 323, 415, 529.

Corriedale sheep, 532.

Coulommier cheese, 481.

Cowgrass, 413.

Cow-peas, 450.

Cows—

- Culling, 486.
- Feeding of, 27.
- Green fodder for, 108.
- Race-bails for, 536.
- Winter feed for, 6.

Cow-testing—

- Experience of Mr. Thomas McPhillips, Manaia, 98.
- In Scotland, 268.
- Notes, 176, 258.
- Views of Mr. James Dunlop, 386.
- Work at Marlborough High School, 381.

Cream (Devonshire clotted), 103.

Crop reports, 71, 150, 223, 325, 419, 520.

Culling dairy cows, 486.

Cultivation—

- Of forage plants, 452.
- Of rape, 17.
- Of vegetables, 502.
- Thorough, 378.

Cultivator for orchard, 20.

Cutting lucerne, 367.

D.

Dairying industry—

- Ayrshire cow "Eileen," property of Mr. G. D. Mode, Ontario, Canada, 476.

Basis of factory payment for milk for cheesemaking, 529.

Butter and cheese quality, 179, 483.

Californian butter market, 178.

Chou moellier for dairy cows, 117.

Cow-testing: Experience of Mr. Thomas McPhillips, Manaia, 98.

Cow-testing in Scotland, 268.

Cow-testing notes, 176, 258.

Cow-testing views of Mr. James Dunlop, 386.

Cow-testing work at Marlborough High School, 381.

Culling dairy cows, 486.

Devonshire clotted cream, 103.

Ensilage as fodder for dairy cows, 7, 157.

Dairying industry—*continued*.

- Feeding of cows, 27.
- Fishy flavour in butter, 1.
- Grading of casein, 162.
- Green fodder for cows, 108.
- Holsteins and Ayrshires imported by Department, 180.
- Holsteins at Longbeach, 385.
- London inspection of dairy-produce, 114, 183.
- Lucerne feeding to dairy cattle, 81.
- Milking-machines: How to clean them, 477.
- Milk-producing qualities of different fodder plants, 451.
- Milk-record Ayrshires, 26.
- Milk-testing, 229.
- New Zealand butter, 101.
- Question of returns and results from different breeds of dairy stock, 324.
- Race-bails for cows, 536.
- Salting butter, 323, 417.
- Soft-cheese making, 30, 267, 481.
- Thousand-headed kale as food for dairy stock, 531.
- Unreliability of short tests, 386.
- Value of persistency in a dairy cow, 258.
- Vancouver butter market, 428.
- Winter feed for dairy cows, 6.
- Danthonia, 413.
- Demonstration in ensilage-making at Marton Junction, 7.
- Depleted country, revegetating experiments in Mackenzie country and Central Otago, 21, 308, 377.
- Destruction of rabbits by fumigation with bisulphide of carbon, 474.
- Devonshire clotted cream, 103.
- Dipping sheep, 468.
- Diseases, ailments, and pests of animals—
 - Calf trouble, 79.
 - Common ailments of the farm dog, 369, 463.
 - Contagious abortion in dairy cows, 237.
 - Diseases of bees, 394.
 - Failure of conception in dairy cows, 242.
 - Foot-and-mouth disease in Britain, 336.
 - Horny growths on the fetlocks of a foal, 94.
 - Mortality in foals through eating bark of *Robinia Pseudo-acacia*, 252.
 - Tutu poisoning, 78.
 - Worms affecting horses, 79.
 - Worms in lambs, 78.
- Diseases and pests of plants—
 - Bitter-rot of apples, 57.
 - Black-spot and mildew of grape, 57.
 - Blight attacking *Pinus insignis* and *Pinus muricata*, 157.
 - Brown-rot of lemon, 284.
 - Californian thistle attacked by rust, 139.
 - Cherry-leaf scorch, 500.
 - Club-root, 229, 486.

Diseases and pests of plants—*continued*.

- Codlin-moth, 56, 140.
- Collar-rot of lemon, 157.
- Disease of sunflowers, 530.
- Dodder in lucerne crops, 306.
- Leech, 57, 140.
- Lucerne pest, a, 173.
- Mangel-disease, 255.
- Mussel scale, 500.
- Orchard pests and diseases, 210.
- Red spider, 500.
- Root-fungus, 500.
- Strawberry leaf-spot, 500.
- Turnip-beetle, kerosene seed-dressing for, 97.
- Verrucosis and brown-rot of lemon, 500.
- Woolly aphis, control of, 210, 500.
- Distemper of dogs, 369.
- Dodder in lucerne crops, 306.
- Dog (farm), common ailments of, 369, 463.
- Dogstail, 413.
- Dressing (top), 418.
- Drying of apples, 535.

E.

- Ear-canker of the dog, 466.
- Early sheep feed, 380.
- Eczema affecting dogs, 467.
- Egg-market (British), 322.
- English oat, 312.
- Ensilage, 7, 104, 157, 229, 249.
- Eradicator (weed), 201.
- Eruca sativa*, a lucerne-pest, 173.
- Establishing lucerne, 363.
- European markets for Argentine produce, 432.
- Experiments (co-operative)—
 - Clover and grass trials on gum lands at Kumeu, 518.
 - Ensilage at Marton Junction, 7.
 - Experimental cereals, 312.
 - Forage crop tests in South Island, 303.
 - Marton plots, 10.
 - Milling tests of New Zealand wheat, 410.
 - North Island investigators, 191.
 - Pea variety trials, 43.
 - Permanent pasture, at Taupo Road, 412.
 - Potato variety trials at Patea, 516.
 - Revegetation of depleted country, 21, 308, 377.
 - South Island investigators, 122.
 - Surface sowing of gum swamps at Kumeu, 517.
 - Turnip manurial and variety trials in South Island, 295.
 - Wheats (introduced), tests of, at Marton, 314.
- Export—
 - Fruit trade, 119.
 - Lambs for, 379.
 - Trade in apples, 271.
 - Trade in lamb: Argentine competition, 253.

Exports—

- From Argentine to United Kingdom, 85, 234, 333, 540.
- From New South Wales, 336.
- From New Zealand to United Kingdom, 83, 160, 231, 330, 430, 537.
- Of oats, 319.
- Of stock, 85, 161, 233, 332, 432, 539.
- Ewe, œstrum period of, 323.

F.

- Failure of conception in dairy cows, 242.
- Farm dog, common ailments of, 369, 463.
- Farm garden, the, 62, 142, 212, 285, 398, 502.
- Farm implements, 89.
- Farm-women circles in Belgium, 306.
- Fastener for gate, 48.
- Fattening lambs, 469.
- Federation wheat, 462.
- Feed—
 - For sheep, 380, 415.
 - (Winter) for dairy cows, 6.
- Feeding—
 - Lucerne to cattle, 81.
 - Of cows, 27.
 - Trough for sheep, 195.
- Feilding lucerne test, 190.
- Fertilizers (see Manure).
- Fescue (tall), 323.
- Field or horse bean, 471.
- Field pepperwort (*Lepidium campestre*), 15.
- Fiorin, 246, 413.
- Fishy flavour in butter, 1.
- Flax (*Linum*), 266.
- Flour trade with the Philippines, 494.
- Flower-garden, 287, 401, 504.
- Foal, horny growths on fetlocks of, 94.
- Fodder crops, 6, 7, 10, 25, 27, 81, 82, 104, 105, 108, 117, 157, 174, 186, 188, 229, 249, 324, 363, 367, 387, 471.
- Fodder (green) for cows, 108.
- Foot-and-mouth disease in Britain, 336.
- Forage crops, 17, 25, 43, 117, 194, 265, 350, 415, 531.
 - At Ruakura, 449.
 - Tests in South Island, 303.
- Foul-brood in North Otago, 397.
- France—
 - New Zealand wool in, 200.
 - Position of, in regard to importation of frozen meat, 318.
- Frost's electric screen and insect-destroyer, 118.
- Frozen meat (see Meat).
- Frozen produce : Development of trade with West of England ports, 197.
- Fruitgrowing—
 - Apple-drying, 535.
 - Apple-packing, 32, 489.
 - Bitter-rot of apples, 57.
 - Black spot and mildew of grape, 57.
 - Brown-rot of lemon, 284.
 - Cherry leaf-scorch, 500.

Fruitgrowing—continued.

- Codlin-moth, 56, 140.
- Collar-rot of lemon, 157.
- Cool-storage of fruit, 59.
- Cover-crops for orchards, 140.
- Cultivation, 209.
- Export fruit trade, the, 119.
- Export of apples, 542.
- Export of fruit from Victoria, 423.
- Fruit-fly in Cook Islands, 121.
- Fruit-growing generally, 80.
- Fruit-packing, 141.
- Fruit-pulp prospects on British markets, 320.
- Fruit varieties recommended, 535.
- Heeling in nursery stock, 283, 498.
- Leech, 57, 140.
- Lemon orchard, 283.
- Monthly notes, 56, 140, 209, 283, 498.
- Mussel-scale, 500.
- Oranges in Golden Bay, 141.
- Pests and diseases, 210, 498.
- Planting new orchards, 283, 498.
- Preserved fruit, 230, 416.
- Red spider, 500.
- Reports, 76, 155, 227, 328, 423, 525.
- Root-fungus, 500.
- Spraying, 499.
- Strawberry leaf-spot, 500.
- Strawberry planting, 209.
- Verrucosis and brown-rot of lemon, 500.
- Woolly aphis, control of, 210, 500.
- Fumigation with bisulphide of carbon for destruction of rabbits, 474.
- Fungus which destroys new paint in glasshouses, 97.

G.

- Garden—
 - Farm, the, 62, 142, 212, 285, 398, 502.
 - Flower, the, 287, 401, 504.
 - Pea, 416.
- Gate-fastener, 48.
- German—
 - Agitation against restrictions on frozen and chilled meat, 198.
 - Importation of Australian mutton, 319.
- Ghent International Exhibition, 29.
- Goats, 82.
- Grading of casein, 162.
- Grain, new varieties of : Where probable supplies may be purchased, 313.
- Grape, black-spot and mildew of, 57.
- Grass—
 - Grub, 532.
 - Seed, 81.
 - Trials on gum lands at Kumeu, 518.
- Grasses—
 - Brown-top, 324.
 - Cocksfoot, 159.
 - Danthonia pilosa* and *D. semiannularis*, 533.
 - Experiments with, at Taupo Road, 412.
 - For hilly country, 531.
 - Paspalum dilatatum*, 324.

Grasses—continued.

- Phalaris commutata*, 229.
- Prairie-grass, 417.
- Red-top, 246.
- Tall fescue, 323.
- Twitch, 158.
- Grassing—
 - Depleted areas, 21, 308, 377.
 - Experiments on gum lands, 111.
- Green fodder for cows, 108.
- Green-manuring, 93.
- Grey hairs in wool, 107.
- Growths (horny) on fetlocks of foal, 94.
- Grub (grass), 532.
- Gum lands—
 - Grassing experiments on, 111.
 - Surface sowing of swamps at Kumeu, 517.
 - Trials of clovers and grasses on, at Kumeu, 518.

H.

- Hay-making, 165.
- Hedge plants, 444.
- Helianthi, 10, 452.
- Hemp—
 - Grading returns, 84, 232, 331, 431, 538.
 - Industry, monthly notes, 50, 135, 202, 277, 392, 493.
 - Market, 203.
 - (Sisal), Mexican valorization scheme, 321.
- Herd testing (see Cow-testing).
- High Commissioner's market reports, 87, 163, 235, 334, 434, 541.
- Holsteins at Longbeach, 385.
- Honey reports, 156, 228, 329, 424, 525.
- Hop market, 194.
- Horny growths on fetlocks of foal, 94.
- Horse-bean, 471.
- Horse-radish, 504.
- Horse, worms affecting, 79.
- Household pest, a, 269.
- Humus-making, 120.

I.

- Implements (farm), 89.
- Importation of Australian mutton into Germany, 319.
- Imports of produce—
 - Into New Zealand, 161, 234, 333, 433, 540.
 - Into United Kingdom, 429.
- Impure seed, 388, 437, 441.
- Insect-destroyer, Frost's, 118.
- Inspection of dairy produce in London, 114, 183.
- Instruction in agriculture at Ruakura, 337.
- Introduced varieties of wheats, 314.
- Italian rye, 16.

J.

- Jerusalem artichokes, 503.

K.

- Kale—
 - Buda, 450, 469.
 - Tests at Belfast, 303.
 - Thousand-headed, 380, 450, 531.
- Kerosene seed-dressing, 97.

L

- Lamb—
 - (Australian) imported into Germany, 428.
 - Export trade, 253.
 - Fattening, 469.
- Lambs—
 - For export, 379.
 - On rape : is shearing an advantage, 265.
 - Worms in, 28.
- Learners at Ruakura Farm of Instruction, 337.
- Leguminous crops at Marton, 10.
- Lemon collar-rot, 157.
- Lettuce, 213, 503.
- Lime, 11, 323, 536.
- Linseed—
 - British market, 49.
 - London market report, 436.
 - (Wild), 534.
- Linum* (flax), 266.
- London inspection of dairy-produce, 114, 183.
- Longbeach Holsteins, 385.
- Lotus corniculatus*, ensilage made from, 157.
- Lotus major*, 413.
- Lucerne—
 - At Ruakura, 449.
 - Cutting, 367.
 - Dodder in, 306.
 - (Establishing), 363.
 - Feeding to cattle, 81.
 - Growing, 157.
 - In Marlborough, 105.
 - Pest of, 173.
 - Query, a, 323.
 - Tests at Weraroa, 188.

M.

- Machinery (farm), 89.
- Machines (milking), 477.
- Mackenzie country : Revegetating experiments, 21.
- Macrocarpa, 534.
- Maize, 415, 449, 469.
- Mange affecting the dog, 468.
- Mangel-disease, 255.
- Manila meat market, 494.
- Manufacture of casein, 274.
- Manure—
 - Basic slag, 19, 417, 454.
 - Bonedust, 418.
 - Experiments—
 - Oats at Ruakura, 461.
 - Potatoes at Halswell and Amberley, 304.
 - Turnips in South Island, 295.

Manure continued.

- For shelter-trees, 535.
- Green-manuring, 93.
- Packages, 361.
- Waste carbide, 417.
- Manuring (green), 93.
- Market—
 - (British) for eggs, 322.
 - (British) reports, 87, 163, 235, 334, 434, 541.
 - (British) for fruit-pulp, 320.
 - For butter in California, 178.
 - For produce in Western Canada, 133, 475.
 - (London) for hops, 194.
- Marrow-cabbage (see *Cuou moellier*).
- Marton Junction—
 - Ensilage demonstration, 7.
 - Experimental plots, 10.
 - Tests of introduced varieties of wheats, 314.
- Meadow fescue, 413.
- Meat (frozen)—
 - Argentine exports to Europe, 432.
 - Australian frozen lamb in Germany, 428.
 - British pork market, 47.
 - Condemned meat in London, 199, 234.
 - German agitation against restrictions on importation of, 198.
 - Importation of Australian mutton into Germany, 319.
 - Importation into France, 46, 318.
 - Importation into Switzerland, 196.
 - Lamb export trade, 253.
 - Shipments from Argentine to Great Britain, 85.
 - Swiss regulations, 319.
 - The beef trade: Second-quality article, 359.
 - Trade in the Argentine, 51.
 - Trade with Philippines, 494.
- Meteorological notes, 425, 526.
- Mexican sisal valorization scheme, 321.
- Milking-machines, 477.
- Milk—
 - Pedigree dairy-stock, 180.
 - Record Ayrshires, 26.
- Milk-testing, 229.
- Moumahaki—
 - Chou moellier at, 117.
 - Experiments in fattening lambs, 469.
- Mutton (Australian) importation into Germany, 319.

N.

- Native trees as hedge plants, 444.
- New South Wales, exports from, 336.
- New varieties of grain: Where probable supplies may be purchased, 313.
- New Zealand—
 - Butter, 101.
 - Wool in France, 530.
- Nitro-bacterine, 530.
- North Island co-operative experiments, 191, 317.
- Noxious weeds, 438.

O.

- Oat—
 - Heads, abnormal development of, 171.
 - Tests with fertilizers at Ruakura, 461.
- Oats—
 - English and Swedish, 312, 313.
 - Exportation of, 319.
 - (Rusted) injurious to stock, 417.
 - Withering of, 532.
- Oestrus period of ewe, 323.
- Onions, 502.
- Opening of Ruakura Farm of Instruction by Hon. T. Mackenzie, 337.
- Orchard—
 - Cultivator, 20.
 - Monthly notes, 56, 140, 209, 283, 498.
- Otago (Central) revegetating experiments, 308, 377.

P.

- Packages (manure), 361.
- Packing apples, 489.
- Parasite—
 - Destroyer, tobacco as, 82.
 - (Vegetable) preventive, 95.
- Paspalum dilatatum*, 324, 413.
- Pasture—
 - Experiments at Taupo Road, 412.
 - Reports, 71, 150, 223, 325, 419, 520.
- Pea—
 - Experiments at Marton, 10.
 - (Garden), 43.
 - Variety trials, 43.
- Peas, 174, 449, 502.
- Pears, cool-storage of, 61.
- Pedigree dairy-stock, 180.
- Pepperwort (field), *Lepidium campestre*, 15.
- Permanent-pasture experiments at Taupo Road, 412.
- Persistency (value of) in a dairy cow, 258.
- Pest—
 - Of lucerne, 173.
 - Of the household, mites (*Tyroglyphus longior*), 269.
- Pests of animals and plants (see Diseases).
- Phalaris commutata*, 229.
- Philippines, flour and meat trade with, 494.
- Phormium tenax* (see Hemp).
- Pigs, 78.
- Pinus insignis* and *Pinus muricata*, blight attacking, 157.
- Pinus muricata* (Peppermint gum), 415.
- Plant-breeding, work on, 535.
- Plant diseases, pests, &c. (see Diseases).
- Plants (hedge), 444.
- Plough, device for shifting, 121.
- Poa Brownii*, 413.
- Poa pratensis*, 413.
- Poisoning from tutu, 78.
- Pork market (British), 47.
- Potato—
 - Manurial and spraying tests at Halswell and Amberley, 304.
 - Variety trials at Patea, 516.

Poultry-keeping—

- Breeding, 68, 220, 290.
- Capital necessary, 146.
- Colds in young stock, 217.
- Corns, 292.
- Culling, 65.
- Ducks, 67.
- Feeding, 406, 407, 510.
- General-purpose fowl, 407.
- Grassing experiment (for brooder-house runs), 293.
- Green feed, 69.
- Housing, 148, 215.
- International Association of Poultry Instructors and Investigators, 513.
- Judging age of fowls, 69.
- Liver troubles, 293.
- London market prices, 88, 236, 436.
- Marketing eggs, 218.
- Mating, 404.
- Maturity, 66.
- Monthly notes, 65, 145, 215, 290, 404, 507.
- Overforcing the pullet, 292.
- Pullets, 145.
- Selling by weight, 148.
- Sitting hen, 510.
- Table-poultry, 146.
- Vermin, 219.
- Winter eggs, 507.
- World's record, 408.
- Prairie-grass, 16.
- Preserved fruit, 230, 416.
- Preventive dressing for vegetable parasite, 95.
- Produce—
 - Imported into New Zealand, 161, 234, 333, 433, 540.
 - Imported into United Kingdom, 429.
 - Shipments from New Zealand to United Kingdom, 83, 160, 231, 330, 430, 537.
- Proper method of stooking, 110.
- Prospects of honey crop, 156, 228, 329, 424, 525.
- Pulp (fruit): Prospects on British markets, 320.
- Pumice soils, 374.

Q.

- Quarantine of stock, 86, 162, 233, 332, 433, 539.

R.

- Rabbit—
 - Destruction with bisulphide of carbon, 474.
 - Nuisance, 41.
- Race-bails for cows, 536.
- Radish (horse), 504.
- Ragwort, 415.
- Rape—
 - Cultivation at Ruakura, 17, 450.
 - For fattening lambs, 469.
 - For sheep-feed, 415.
 - Lambs on: Shearing *v.* non-shearing, 265.
 - Tests at Belfast, 303.

Red clover, 16.

Red-top, 246.

Regrassing depleted country, 21, 308, 377.

Regulations governing importation of meat into Switzerland, 319.

Returns—

- Argentine shipments to Great Britain, 85, 234, 333, 540.
- Hemp and tow graded, 84, 232, 331, 431, 538.
- Produce exported, 83, 160, 231, 330, 430, 537.
- Produce imported, 161, 234, 333, 433, 540.
- Stock exported, 85, 161, 233, 332, 432, 539.
- Stock in quarantine, 86, 162, 233, 332, 433, 539.
- Rhubarb, 213, 503.
- Robinia pseudo-acacia* (locust-tree, or false acacia): Whether injurious to stock, 172, 252.
- Roses, 401, 504.
- Ruakura Farm of Instruction—
 - Establishing lucerne at, 363.
 - Feeding tests with silver-beet, 387.
 - Fertilizer experiments with oats, 461.
 - Forage crop, 449.
 - Opening, by Hon. T. Mackenzie, 337.
 - Utilizing swamp land at, 391.
- Rushes (clearing), 536.
- Rusted oats injurious to stock, 417.
- Rye-corn, 16, 82.

S.

- Salting butter, 323, 417.
- Salt-spray, fence and plants to withstand, 158.
- Sawdon Run, Mackenzie country, re-grassing experiments, 21.
- Scotland, herd-testing in, 268.
- Seakale, 399.
- Seed—
 - Dressing (kerosene), 97.
 - For sowing, 248.
 - Impure, 388, 437, 441.
- Shearing of lambs prior to fattening on rape, 265.
- Sheep—
 - Corriedale breed, 532.
 - Dipping, 468.
 - Feed, 380, 415.
 - Lambs for export, 379.
 - Œstrum period of ewe, 323.
- Sheep's parsley, 413.
- Shelter-trees, 415, 531, 533, 535.
- Shipment—
 - Of apples to London, 271.
 - Of produce to United Kingdom, 83, 160, 231, 330, 430, 537.
- Show dates, 333, 424, 540.
- Shows (winter), 488.
- Silver-beet—
 - Experience at Moumahaki, 186.
 - Feeding tests at Ruakura, 387.
 - For fattening lambs, 469.
 - Tests at Belfast, 303.

Sisal hemp: Mexican valorization scheme, 321.
 Skin-diseases affecting dogs, 467.
 Slag (basic), 19, 418, 454.
 Soft-cheese making, 30, 78, 112, 267, 481.
 Sorghum (Kaffir corn), 324.
 South Island forage-crop tests, 303.
 Southern turnip experiments, 295.
 Soya beans, 10, 450.
 Spraying tests with potatoes at Halswell and Amberley, 304.
 Steamship service between Australia and Austria-Hungary, 336.
 Stock—
 Exported, 85, 161, 233, 332, 432, 539.
 In quarantine, 86, 162, 233, 332, 433, 539.
 Stooking, proper method of, 110.
 Storage (cool) of fruit, 59.
 Strawberry planting, 209.
 Sunflowers, disease of, 530.
 Surface-sowing of gum swamps at Kumeu, 517.
 Swamp land—
 Sowing of, at Kumeu, 517.
 Utilizing, 391.
 Swede—
 John Bull variety, 387.
 Manurial tests, 295.
 Variety tests, 296.
 Swedish barleys, oats, and wheats, 312, 313.
 Swift Beef Company, sales of, 536.
 Swiss meat regulations, 319.

T.

Tall fescue, 323, 413.
 Tall oat, 413.
 Tares, 16.
 Tennis-court, preparation of, 533.
 Testing—
 Herd, 98, 176, 268, 258, 381, 387.
 (Milk), 229.
 Oats at Ruakura, 461.
 Tests in manuring and spraying potatoes at Halswell and Amberley, 304.
 Thistle (Californian), 79, 346, 390.
 Thorough cultivation, 378.
 Thousand-headed kale, 380, 450, 531.
 Tick-beans, 16.
 Tobacco as a parasite-destroyer, 82.
 Tomatoes, 58.
 Top-dressing—
 Query, a, 418.
 With lime, 323.
 Tow-grading returns, 84, 232, 331, 431, 538.
 Trees (shelter), 415, 533.
 Trough (feeding), 195.
 Turnips—
 Beetle, kerosene seed-dressing for, 97.
 Cultivation of, 503.
 Experiments in South Island, 295.
 For sheep feed, 380.
 Tutu poisoning, 78.

Twitch-grass, 158.
Tyroglyphus longior: A household pest, 269.

U.

Utilizing swamp land, 391.

V.

Vacant ground, treatment of, 504.
 Vancouver butter market, 428.
 Vegetable—
 Cultivation, 502.
 Garden, 62, 142, 212, 285, 398, 502.
 Parasite preventive, 95.
 Vetches, 532.
 Veterinary questions, 82.

W.

Waste carbide as a fertilizer, 417.
 Weather and crop reports, 71, 150, 223, 325, 419, 425, 520, 526.
 Weeds—
 Bidabid, 81.
 Californian thistle, 79, 346, 390.
 Dodder in lucerne crops, 306.
 Eradicator, 201.
 Field pepperwort (*Lepidium campestre*), 15.
 Generally, 23.
 (Noxious), 428.
 Ragwort, 415.
 Seeds, 388, 437.
 Weraroa—
 Lucerne tests, 188.
 West Canadian—
 Apples, 120.
 Markets, 133, 475.
 Wheat—
 (Australian) standard, 432.
 Australian, Swedish, and Anglo-French, 312.
 (Canadian), 313.
 Experiments at Marton, 10.
 (Federation), 462.
 Introduced varieties of, 314.
 (New Zealand), milling tests of, 410.
 White clover, 413.
 Wild linseed, 534.
 Wine (adulterated), 390.
 Winter—
 Feed for dairy stock, 6.
 Rhubarb, 213.
 Shows, 488.
 Wool—
 Black and grey hairs in, 107.
 London market report, 436.
 (New Zealand) in France, 200.
 Woollen manufacture, China's development in, 528.
 Worms—
 Affecting dogs, 372.
 In lambs, 78.

Y.

Yarrow, 413.

ILLUSTRATIONS.

	PAGE
Harvesting Oats in Marlborough : Frontispiece.	
Making a Silage-stack at Marton Junction ...	9
Marton Experimental Plots—	
The Oat and Pea Crop ...	10
The Plots : Western Aspect ...	12
The Plots : Looking to the North ...	13
The Plots : Eastern Aspect ...	14
Field Pepperwort (<i>Lepidium campestre</i>) ...	15
An Improved Orchard-cultivator at Waerenga ...	20
Visitors' Quarters, Office, &c., at Weraroa ...	22
The Chou Moellier Crop at Ruakura ...	25
Milking-time on a Danish Dairy Farm ...	26
International Exhibition of Ghent : Front Elevation of Building ...	29
Apple-packing—	
Plan of Packing-house ...	34
Grading-table ...	35
Straight or Square Packs ...	37
Diagonal Packs ...	38
Method of Packing ...	39
New Zealand Dairy Association's Factory at Ngaruawahia ...	40
Riverdale Dairy Company's Factory, Taranaki ...	45
A New Zealand Meat Export Company's Works ...	46
Baled Straw used for a Pig-shelter on a South Australian Farm ...	47
A Simple Gate-fastener ...	48
The Apiary—	
Correct Method of shaking Frames ...	53
Bee-escape ...	54
Feed-room and Incubator Building in Poultry Section at Ruakura ...	55
A Nelson Vinery ...	58
<i>Acacia Baileyana</i> : Frontispiece.	
Planet Jr. Triple Horse-hoe at Moumahaki ...	93
Horny Growths on Fetlocks of Foal ...	94
Romneys at Weraroa ...	95
Mr. T. McPhillips, Manaia ...	98
Bringing in the Cows on a Danish Dairy Farm ...	102
Jersey Cow "Grannie's Girl"; Dam of Bull "Grannie's Campanile Sultan," at Ruakura ...	104
Lucerne in Marlborough—	
Cutting Lucerne on Adams Bros.' Farm... ..	105
Cultivator used on the Farm ...	106
Carting in Lucerne Hay ...	106
Barley and Tares at Moumahaki ...	109
Proper Method of stooking : A Ruakura Stook ...	110
Members of the Ayrshire Herd at Moumahaki ...	113
Chou Moellier at Moumahaki ...	117
Frost's Electric Screen and Insect-destroyer... ..	118
Making Humus ...	120
Shifting a Plough ...	121
Apparatus for weighing and recording Milk-yield at Weraroa ...	134
Oranges in Golden Bay ...	141
Properly Fattenend Cockerels ...	147
On the River Flat at Moumahaki : Frontispiece.	
Hay-making—	
The Hay-tedder at Work ...	166
Bringing the Sweeper to the Hay-lift ...	167
The Lift tipping its Load on to the Stack ...	168
Diagrams showing Wrong and Right Way to build a Stack ...	169
The Hay-lift in operation ...	170
Abnormal Development of Oat-heads ...	171
Pea-crop at Moumahaki ...	175

	PAGE
An American Guernsey	178
Silver-beet at Moumahaki	187
Lucerne at Weraroa—	
Varieties	189
Second Growth	190
Cheap Feeding-trough at Waerenga	195
Weed-eradicator at Waerenga	201
Division-board Bee-feeder	208
Patent Berry Hoe at Waerenga	208
Apple-trees in Blossom in a Nelson Orchard...	210
Control of Woolly Aphis at Weraroa	211
Lettuces at Weraroa	214
Incubator-room at Milton Poultry Farm	220
Vinehouse of Mr. E. B. Izard, Stoke : Frontispiece.	
Contagious Abortion in Dairy Cows : Diagrams showing Irrigation of Vagina and Womb	243
Fiorin and Red-top	247
Ensilage-stack at Moumahaki	252
Disease on Leaves of Mangel and Silver-beet	256, 257
Herd-testing : Leading Cow	259
Barley-crop at Moumahaki	261
Wheat Black-mould	263
Little Welsh Cheese made at Whakaronga Factory	268
Apple-export Trade—	
Packing Apples for export in a Nelson Orchard	271
Transhipping from the Nelson Steamer into the Home Boat at Wellington	272
Stowing the Apples in the Hold of the Oversea Steamer	273
Chou Moellier on the Totara Estate, Oamaru	276
Jacobsen Honey-capping Press	280
Lenz Honey-capping Press	281
How to cover up the Rubbish-heap	286
Houses and Runs on Heretaunga Poultry Plant, Upper Hutt...	291
Opening of Ruakura Farm of Instruction—	
Hon. T. Mackenzie and First Students : Frontispiece.	
Students' Sitting-room in the Homestead	340, 341
Writing-room and Library	343
Student's Bedroom	344
Corner of Students' Lavatory and Bathroom	344
Student cultivating a Millet Crop	345
Californian Thistle—	
Female Plant	348, 349
Male Plant	352, 353
Heads of Thistle	355
Aberdeen-Angus Bull "Premier of Dalmeny"	358
Belfast Experimental Plots—	
Maize	362
Chou Moellier	368
Mixed Forest on Pumice at 1,800 ft., Mamaku	375
Longbeach Holsteins—	
Three of First Holstein Cows bred at Longbeach	384
Taureau II, One of the First Bulls bred at Longbeach	385
Silver-beet at Belfast Experimental Plots	387
Weed-seed Reference-card	389
"Hand" Swarm-controlling Hive	396
Table-centre of Cosmos and Rhodes-grass at Ceremony of Official Opening of Ruakura Farm of Instruction	403
Six White Leghorn Hens which established a World's Record in Roseworthy College Laying Competition, South Australia	409
Greenhouse at Ruakura : Frontispiece.	
Section of Fruit-testing Acre established by Stoke Fruitgrowers' Association ...	443
Native Trees as Hedge-plants—	
<i>Pittosporum Huttonianum</i>	444
<i>Dodonea viscosa</i> and <i>Pittosporum eugenioides</i>	445
<i>Pittosporum Ralphii</i> and <i>Coprosma Baueri</i>	446
<i>Senecio Greyii</i>	447
Basic Slag : Production of—	
Converter turned up, with the "Blow" in operation...	456
Converter turned down after "Blow" is finished	457
Corner of Federation Wheat on Pukehoe, Property of Mr. Donald Fraser, Bull's	460

	PAGE
Federation Wheat, grown by Mr. Fraser, Bull's	462
Comeback Wheat, grown by Mr. Warriner at Greatford	468
Plan of Cattle-yard, Drafting-race, and Crush-pen	470
Field or Horse Bean at Moumahaki—	
The Crop	472
The Roots of Two Plants, showing Bacterial Nodules	473
Eileen, a Canadian Utility Ayrshire	476
Two of the Pure-bred Milking Illawarra Shorthorn Cows at Weraroa	478
Two Pure-bred New Zealand Shorthorn Heifers at Weraroa	479
Domino III and Spot, Two Members of the Weraroa Holstein Herd	484, 485
Cows which demonstrated Value of testing	487
Apple-packing—	
Method of wrapping Apple in Paper	490
Method of packing in Cases	491
Demonstration in a Nelson Orchard	492
Vineyard at Arataki	501
Nelson Hop-garden	506
Diagrams illustrating Egg-fertility	511
Ducks at Ruakura	513
Department's Display at Dunedin Winter Show	514, 515

